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III. Directional Correlations of Two Radiations Emitted
from Oriented Nuclei and Triple Directional Correlations

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Angular Distributions and Correlations of Radiations Emitted from Oriented Nuclei

III. Directional Correlations of Two Radiations Emitted from Oriented Nuclei and Triple Directional Correlations

by

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ABSTRACT

A convenient and generally applicable formulation of the directional correlation of two successive nuclear radiations emitted from an initial oriented nuclear state and of triple directional correlations is presented. The pertinent generalized directional-distribution coefficients are expressed in terms of generalized F-coefficients. Extensive numerical tables of these coefficients are given. For normal and parallel geometries, the directional correlation of radiations from oriented states or the triple directional correlation can be expressed in terms of the ordinary Legendre polynomials; i.e., $W(\theta) = \sum_{\Lambda} \Gamma_{\Lambda} P_{\Lambda}(\cos \theta)$. Graphs of the distribution parameters Γ_{Λ} as a function of the explicitly defined gamma multipole mixing ratios δ are presented, and some special cases are discussed in detail.

I. Introduction

Angular-distribution and -correlation measurements of nuclear radiations are an important tool in nuclear-structure research. In particular, the accurate determination of the relative contributions of several multipole components to a nuclear transition generally relies on angular-distribution or -correlation measurements. The general theory of angular distributions and correlations of nuclear radiations has been discussed in LA-4565-MS.¹ Practical formulae, tables, and graphs for the analysis of angular distribution and correlation experiments involving gamma radiation have also been presented.²

In some cases, especially if more than two multipoles are present in a transition, unambiguous determination of the multipole mixing ratios is difficult or impossible, if only the angular distribution of one radiation emitted from an oriented source or only the angular correlation of two radiations from an unoriented source is observed.

In such cases, additional information about the mixed-multipole character of a transition may be obtained by measuring the angular correlation of two radiations emitted from an oriented source or by observing the triple angular correlation of three radiations, the first of which is emitted from a random source. The descriptions of the two phenomena are equivalent. In the former case, the orientation of a nuclear state with angular-momentum quantum number I_1 is produced either as the result of a nuclear reaction (see Fig. 1) or of a Coulomb excitation process with the beam direction as the orientation axis, or by low-temperature orientation techniques in which the orientation axis is determined by the orienting external fields. In triple angular correlations, an ensemble of oriented nuclear states I_1 is produced by observing a preceding radiation X_0 from a random state I_0 that leads to the formation of state I_1 . The orientation axis in this case is determined by the direction in which radiation X_0 is observed.

Fig. 1.

Two successive radiations X_1 and X_2 emitted from an oriented nuclear state I_1 .

Triple directional correlations and directional correlations of two radiations emitted from oriented nuclear states have been considered previously.^{3,4} This paper presents a more practical formulation of these phenomena, and the explicit definition of the reduced gamma matrix

$$B_\lambda(I_1; X) = \frac{\sum_{L, L'} (-1)^{L+L'+\lambda} b_\lambda(LL'; X) F_\lambda(LL'; I_0 I_1) \langle I_1 \| X_L \| I_0 \rangle \langle I_1 \| X_{L'} \| I_0 \rangle^*}{\sum_L b_0(L; X) |\langle I_1 \| X_L \| I_0 \rangle|^2}, \quad (3)$$

elements as proposed by Krane and Steffen⁵ is consistently used.

II. Orientation of the Initial Nuclear State

In the following it is assumed that the oriented state I_1 is axially symmetric with respect to the orientation axis $\hat{z}$. This situation is realized if the incident particle in a nuclear reaction or Coulomb excitation process is not polarized and if the outgoing reaction particle or exciting ion is not observed or is observed by a detector that is axially symmetric with respect to the beam direction (annular detector). In a triple angular correlation experiment, observation of only the direction (no transverse polarization observation) of the first radiation X_0 results in an axially symmetric oriented state I_1 .

The orientation of an axially symmetric state is completely described by the orientation parameters $B_\lambda(I_1)$ which are defined with respect to the orientation (symmetry) axis $\hat{z}$. The orientation parameters are discussed in detail in Ref. 1. For completeness, however, we discuss the $B_\lambda(I_1)$ briefly here.

The $B_\lambda(I_1)$ are obtained from the relative populations $P(m)$ of the magnetic nuclear states $|I_1 m\rangle$ with respect to $\hat{z}$.

$$B_\lambda(I_1) = (2I_1 + 1) \sum_m (-1)^{I_1 + m} \langle I_1 - m \ I_1 \ m | \lambda 0 \rangle P(m). \quad (1)$$

If $\sum_m P(m) = 1$, then $B_0(I_1) = 1$.

In nuclear-reaction experiments or for low-temperature orientation, the $P(m)$ must be computed on the basis of the reaction mechanism or from the orientation mechanism. Krane⁶ has prepared tables of $B_\lambda(I_1)$ for the latter case. For Coulomb excitation of the state I_1 from a ground state I_0 , the orientation parameters are given by

$$B_\lambda(I_1; CEx) = a_\lambda^{(\pi L)}(\xi, \eta) F_\lambda(LL; I_0 I_1), \quad (2)$$

where the $a_\lambda^{(\pi L)}(\xi, \eta)$ are the Coulomb excitation particle parameters as defined by Alder et al.⁷ The $F_\lambda(LL; I_0 I_1)$ is an ordinary F-coefficient (see Refs. 1-3).

If the state I_1 is oriented by directional observation of a preceding radiation X in the direction $\hat{z}$ (observation direction defines the orientation axis $\hat{z}$), the orientation parameters $B_\lambda(I_1; X)$ of state I_1 are

Where the $\langle I_1 \| X_L \| I_0 \rangle$ are the reduced matrix elements for the emission of the 2^L multipole component of the radiation X . The $b_\lambda(LL'; X)$ are the particle parameters of radiation X .⁸ Note that the particle parameters for beta decay as used in the angular-correlation literature include the factor $(-1)^{L+L'+\lambda}$ and the reduced nuclear beta matrix elements $\langle I_1 \| \beta_L \| I_0 \rangle \langle I_1 \| \beta_{L'} \| I_0 \rangle^*$. For a gamma transition that is a mixture of two multipoles πL and $\pi' L'$ ($\pi = E$ for electric multipoles, $\pi = M$ for magnetic multipoles), the orientation parameters are

$$B_\lambda(I_1; \gamma) = \frac{F_\lambda(LL; I_0 I_1) + (-1)^{L+L'} 2\delta F_\lambda(LL'; I_0 I_1) + \delta^2 F_\lambda(L'L'; I_0 I_1)}{1 + \delta^2}, \quad (4)$$

where the mixing ratio δ is defined by

$$\delta = \frac{\langle I_1 \| \vec{J}_N \vec{A}_L^{(\pi')} \| I_0 \rangle}{\langle I_1 \| \vec{J}_N \vec{A}_L^{(\pi)} \| I_0 \rangle}. \quad (5)$$

Graphs for computation of the $B_\lambda(I_1; \gamma)$ for mixed-multipole gamma transitions are presented in Ref. 2. Explicit definitions of the reduced gamma matrix elements are

given in Ref. 5. The emitting state, I_0 ($E_0 > E_1$), is *always* written on the right-hand side in the reduced matrix element.

For a pure multipole $\pi'L' = \pi L$,

$$B_\lambda(I_1; \gamma) = F_\lambda(LLI_0I_1) \cdot \quad (6)$$

Nuclear states that are oriented by low-temperature methods, Coulomb excitation, and observation of a preceding beta particle are often polarized. In this case, the orientation parameters $B_\lambda(I_1)$ with odd λ do not vanish, and their effects on the directional correlation must be taken into account in certain circumstances.

III. Directional Correlation of Nuclear Radiations Emitted from an Oriented State

A. General Geometries. The directional correlation of two radiations X_1 and X_2 emitted from an initial nuclear state I_1 that is oriented with axial symmetry is given by Eq. (4.23) in Ref. 1:

$$W(\theta_1, \theta_2, \phi) = 4\pi \sum_{\lambda_1 \lambda_2} B_{\lambda_1}(I_1) C_0^{\lambda_1}(X_1) A_{\lambda_2}(X_2) [(2\lambda_1+1)(2\lambda_2+1)]^{-\frac{1}{2}} \times \sum_q \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle Y_{\lambda q}(\theta_1, 0) Y_{\lambda q}^*(\theta_2, \phi). \quad (7)$$

The angles θ_1 , θ_2 , and ϕ are defined in Fig. 2. Tables of the spherical harmonics $Y_{\lambda q}(\theta, \phi)$ are presented in Appendix A, and numerical values of the Clebsch-Gordan coefficients $\langle \lambda_1 0 \lambda_2 q | \lambda q \rangle$ are tabulated in Appendix B.

As discussed above, odd values of the index λ are permitted, depending on the means of orientation. For

Fig. 2.

The angles in a directional correlation of two successive radiations, X_1 and X_2 , emitted from an axial symmetric oriented source, S (DCO).

directional distributions of parity-conserving radiations, only even values of λ and λ_2 are permitted. In addition, as discussed below, the angular dependence requires that the sum $\lambda_1 + \lambda + \lambda_2$ be even, unless the directional linkage tensors C_0^λ contain a nonvanishing imaginary part. Thus, for most cases, only even values of λ_1 , λ , and λ_2 need be considered.

The $A_{\lambda_2}(X_2)$ are the normalized [$A_0(X_2) = 1$] directional-distribution coefficients for radiation X_2 . The directional distribution coefficients $A_\lambda(X)$ for radiation X are given by

$$A_\lambda(X) = \frac{\sum_{LL'} b_\lambda(LL'; X) F_\lambda(LL'I_3I_2) \langle I_3 || \vec{X}_L || I_2 \rangle \langle I_3 || \vec{X}_{L'} || I_2 \rangle^*}{\sum_L b_0(LL; X) |\langle I_3 || \vec{X}_L || I_2 \rangle|^2}. \quad (8)$$

The directional distribution coefficient for a mixed πL and $\pi'L'$ gamma multipole transition is

$$A_\lambda(\gamma) = \frac{F_\lambda(LL'I_3I_2) + 2\delta F_\lambda(LL'I_3I_2) + \delta^2 F_\lambda(L'L'I_3I_2)}{1 + \delta^2}, \quad (9)$$

where

$$\delta = \frac{\langle I_3 || \vec{A}_L^{(\pi')} || I_2 \rangle}{\langle I_3 || \vec{A}_L^{(\pi)} || I_2 \rangle}. \quad (10)$$

Graphs of $A_\lambda(\gamma)$ as a function of δ are presented in Ref. 2. The directional linkage tensors $C_0^\lambda(X_1)$ defined in Eq. (4.22) of Ref. 1 can be written compactly by using the generalized F-coefficients, which Weidenmüller⁹ introduced in his discussion of first-forbidden beta decay. The generalized F-coefficients are defined by

$$F_\lambda^{\lambda_2 \lambda_1}(LL'I_2I_1) = \left[(2I_1+1)(2I_2+1)(2L+1)(2L'+1)(2\lambda_1+1)(2\lambda_2+1) \right]^{\frac{1}{2}} \times (-1)^{L'+\lambda_2+1} \begin{pmatrix} L & L' & \lambda \\ 1 & -1 & 0 \end{pmatrix} \begin{Bmatrix} I_2 & L & I_1 \\ I_2 & L' & I_1 \\ \lambda_2 & \lambda & \lambda_1 \end{Bmatrix}, \quad (11)$$

where $\left\{ \begin{matrix} \end{matrix} \right\}$ is the Wigner 9-j symbol. The generalized F-coefficients have the following important symmetry properties.

Interchange of L and L' :

$$F_\lambda^{\lambda_2 \lambda_1}(L'L'I_2I_1) = (-1)^{\lambda+\lambda_1+\lambda_2} F_\lambda^{\lambda_2 \lambda_1}(LL'I_2I_1). \quad (12)$$

Interchange of I_1 and I_2 :

$$F_\lambda^{\lambda_1 \lambda_2}(LL'I_1I_2) = (-1)^{\lambda+\lambda_1+\lambda_2+L+L'} F_\lambda^{\lambda_2 \lambda_1}(LL'I_2I_1). \quad (13)$$

The generalized F-coefficients vanish if

$$\begin{aligned}\lambda &> L+L', \\ \lambda &> \lambda_1 + \lambda_2, \\ \lambda_1 &> 2I_1,\end{aligned}$$

or

$$\lambda_2 > 2I_2. \quad (14)$$

The $F_{\lambda}^{\lambda_2 \lambda_1}$ are normalized to unity.

$$F_0^{00}(LL'I_2I_1) = \delta_{LL'}. \quad (15)$$

If λ_1 or λ_2 vanishes (state I_1 or I_2 random, respectively), the $F_{\lambda}^{\lambda_2 \lambda_1}$ reduce to the ordinary F-coefficients

$$F_{\lambda}^{0\lambda}(LL'I_2I_1) = F_{\lambda}(LL'I_2I_1) \quad (16a)$$

and

$$F_{\lambda}^{\lambda 0}(LL'I_2I_1) = (-1)^{L+L'} F_{\lambda}(LL'I_1I_2). \quad (16b)$$

If λ vanishes (radiation X_1 not observed), the $F_{\lambda}^{\lambda_1 \lambda_2}$ reduce to the deorientation factors $u_{\lambda_1}(LI_2I_1)$.

$$\begin{aligned}F_0^{\lambda_1 \lambda_2}(LL'I_2I_1) &= (-1)^{I_1+I_2+L} \left[(2I_1+1)(2I_2+1)(2\lambda_1+1) \right]^{\frac{1}{2}} \begin{Bmatrix} I_1 & I_1 & \lambda_1 \\ I_2 & I_2 & L \end{Bmatrix} \delta_{LL'} \\ &= (-1)^{\lambda_1} (2\lambda_1+1)^{\frac{1}{2}} u_{\lambda_1}(LI_2I_1) \end{aligned} \quad (17)$$

$$\begin{aligned}A_{\lambda}^{\lambda_2 \lambda_1}(\delta) &= \left\{ F_{\lambda}^{\lambda_2 \lambda_1}(11I_2I_1) + 2\delta_1 F_{\lambda}^{\lambda_2 \lambda_1}(12I_2I_1) + \delta_1^2 F_{\lambda}^{\lambda_2 \lambda_1}(22I_2I_1) + 2\bar{\delta}_1 F_{\lambda}^{\lambda_2 \lambda_1}(13I_2I_1) \right. \\ &\quad \left. + 2\delta_1 \bar{\delta}_1 F_{\lambda}^{\lambda_2 \lambda_1}(23I_2I_1) + \bar{\delta}_1^2 F_{\lambda}^{\lambda_2 \lambda_1}(33I_2I_1) \right\} \left\{ 1 + \delta_1^2 + \bar{\delta}_1^2 \right\}^{-1}, \end{aligned} \quad (22)$$

Tables of the $u_{\lambda}(LI_2I_1)$ can be found in Refs. 2 and 6. Numerical tables of the $F_{\lambda}^{\lambda_2 \lambda_1}(LL'I_2I_1)$ have been computed on the LASL CDC 6600 computer for $L, L' \leq 3$; $I_1, I_2 \leq 20$; and $\lambda_1, \lambda_2, \lambda \leq 4$. These tables are presented in Appendix C.

The directional linkage tensors can now be written in the convenient form

$$C_0^{\lambda}(X) = \sum_{L, L'} b_{\lambda}(LL'; X) F_{\lambda}^{\lambda_2 \lambda_1}(LL'I_2I_1) \langle I_2 \| X_L \| I_1 \rangle \langle I_2 \| X_L \| I_1 \rangle^*, \quad (18)$$

where the $b_{\lambda}(LL'; X)$ are the particle parameters for radiation X .* We now define the *generalized directional distribution coefficients* $A_{\lambda}^{\lambda_2 \lambda_1}(X)$ for radiation X .

*The particle parameters for beta decay usually include, in addition to the reduced matrix elements, a phase factor $(-1)^{L+L'+\lambda}$ which must be corrected for in using Eq. (18).

$$A_{\lambda}^{\lambda_2 \lambda_1}(X) = \frac{\sum_{L, L'} b_{\lambda}(LL'; X) F_{\lambda}^{\lambda_2 \lambda_1}(LL'I_2I_1) \langle I_2 \| X_L \| I_1 \rangle \langle I_2 \| X_L \| I_1 \rangle^*}{\sum_L b_0(LL'; X) |\langle I_2 \| X_L \| I_1 \rangle|^2} \quad (19)$$

These coefficients are normalized such that [see Eqs. (16) and (17)].

$$A_{\lambda}^{0\lambda_1}(X) = A_{\lambda}(X) \delta_{\lambda \lambda_1}, \quad (20a)$$

$$A_{\lambda}^{\lambda_2 0}(X) = B_{\lambda}(X) \delta_{\lambda \lambda_2}, \quad (20b)$$

and

$$A_0^{\lambda_2 \lambda_1}(X) = (-1)^{\lambda_1} (2\lambda_1+1)^{\frac{1}{2}} u_{\lambda_1 \lambda_1}(X) \delta_{\lambda_1 \lambda_2}. \quad (20c)$$

where the $A_{\lambda}(X)$ and $B_{\lambda}(X)$ are the normalized directional distribution coefficients, Eq. (8), and orientation parameters, Eq. (3), respectively. The normalized [$U_{00}(X) = 1$] deorientation coefficient $U_{\lambda \lambda}(X)$ for the unobserved radiation X is defined by

$$U_{\lambda \lambda}(X) = \frac{\sum_L b_0(LL'; X) u_{\lambda}(LI_2I_1) |\langle I_2 \| X_L \| I_1 \rangle|^2}{\sum_L b_0(LL'; X) |\langle I_2 \| X_L \| I_1 \rangle|^2}. \quad (21)$$

For example, the generalized distribution coefficient for a gamma transition that is a mixture of dipole, $L = 1$; quadrupole, $L = 2$; and octupole, $L = 3$, radiations is

where

$$\delta_1 = \frac{\langle I_2 \| \vec{J}_N^{\vec{A}_2^{(\pi')}} \| I_1 \rangle}{\langle I_2 \| \vec{J}_N^{\vec{A}_1^{(\pi)}} \| I_1 \rangle}, \quad (23a)$$

and

$$\bar{\delta}_1 = \frac{\langle I_2 \| \vec{J}_N^{\vec{A}_3^{(\pi)}} \| I_1 \rangle}{\langle I_2 \| \vec{J}_N^{\vec{A}_1^{(\pi)}} \| I_1 \rangle}. \quad (23b)$$

Note that in the case $\lambda_1 + \lambda + \lambda_2 = \text{odd}$, Eq. (13) requires the vanishing of the terms in Eq. (22) which are linear in the δ 's.

Using the generalized directional distribution coefficients, one can write the directional correlation of two successive radiations X_1 and X_2 emitted from an oriented nuclear state I_1 in the form

$$W(\theta_1, \theta_2, \phi) = \sum_{\lambda_1 \lambda_2} B_{\lambda_1}(I_1) A_{\lambda_2}^{\lambda_1 \lambda_2}(X_1) A_{\lambda_2}(X_2) H_{\lambda_1 \lambda_2}(\theta_1, \theta_2, \phi), \quad (24)$$

where the angular function $H_{\lambda_1 \lambda_2}(\theta_1, \theta_2, \phi)$ is defined by

$$H_{\lambda_1 \lambda_2}(\theta_1, \theta_2, \phi) = \sum_{q=-\lambda}^{\lambda'} \frac{4\pi}{[(2\lambda_1+1)(2\lambda_2+1)]^{\frac{1}{2}}} \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle \times Y_{\lambda q}(\theta_1, 0) Y_{\lambda_2 q}^*(\theta_2, \phi). \quad (25)$$

The summation limit λ' is the smaller of λ and λ_2 . The function $H_{\lambda_1 \lambda_2}(\theta_1, \theta_2, \phi)$ reduces to an ordinary Legendre polynomial if any of the λ 's vanish.

1. $\lambda_1 = 0$, Initial State Random.

$$H_{0\lambda\lambda_2}(\theta_1, \theta_2, \phi) = P_{\lambda}(\cos \theta) \delta_{\lambda\lambda_2}, \quad (26)$$

where θ is the angle between $\vec{k}_1$ and $\vec{k}_2$. Equation (24) then represents the ordinary directional correlation of X_1 and X_2 [use $B_0(I_1) = 1$ and Eq. (20b)].

$$W(\theta) = \sum_{\lambda} B_{\lambda}(X_1) A_{\lambda}(X_2) P_{\lambda}(\cos \theta) \quad (27)$$

2. $\lambda_2 = 0$, Radiation X_2 Not Observed.

$$H_{\lambda_1\lambda 0}(\theta_1, \theta_2, \phi) = P_{\lambda}(\cos \theta_1) \delta_{\lambda_1\lambda}, \quad (28)$$

and the distribution function, Eq. (24), represents the directional distribution of the radiation X_1 emitted from the oriented state I_1 [use $A_0(X_2) = 1$ and Eq. (20a)].

$$W(\theta_1) = \sum_{\lambda} B_{\lambda}(I_1) A_{\lambda}(X_1) P_{\lambda}(\cos \theta_1). \quad (29)$$

3. $\lambda = 0$, Radiation X_1 Not Observed.

$$H_{\lambda_1 0 \lambda_2}(\theta_1, \theta_2, \phi) = (-1)^{\lambda_2} 2^{(2\lambda_2+1)-\frac{1}{2}} P_{\lambda_2}(\cos \theta_2) \delta_{\lambda_1 \lambda_2}, \quad (30)$$

where

$$\langle \lambda_1 0 \lambda_2 0 | 00 \rangle = (-1)^{\lambda_1} 2^{(2\lambda_1+1)-\frac{1}{2}} \delta_{\lambda_1 \lambda_2} \quad (31)$$

has been used. The distribution function, Eq. (24), then

represents the 1-3 directional correlation [use Eq. (20c)].

$$W(\theta_2) = \sum_{\lambda_2} B_{\lambda_2}(I_1) A_{\lambda_2 \lambda_2}(X_1) A_{\lambda_2}(X_2) P_{\lambda_2}(\cos \theta_2). \quad (32)$$

For the general case, it is convenient to express the angular function, Eq. (25), in terms of associated Legendre polynomials $P_{\lambda}^q(\cos \theta)$. For $\lambda_1 + \lambda + \lambda_2 = \text{even}$, one obtains

$$H_{\lambda_1 \lambda \lambda_2}(\theta_1, \theta_2, \phi) = \sum_{q=0}^{\lambda'} (2-\delta_{q0}) \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle \left[\frac{(\lambda-q)! (\lambda_2-q)!}{(\lambda+q)! (\lambda_2+q)!} \right]^{\frac{1}{2}} \times P_{\lambda}^q(\cos \theta_1) P_{\lambda_2}^q(\cos \theta_2) \cos q\phi. \quad (33)$$

Tables of the associated Legendre polynomials $P_{\lambda}^q(\cos \theta)$ can be found in Appendix A.

If $\lambda_1 + \lambda_2 + \lambda = \text{odd}$ (e.g. in the case of a $\gamma\gamma$ directional correlation from a polarized state I_1), the angular function $H_{\lambda_1 \lambda \lambda_2}(\theta_1, \theta_2, \phi)$ is of the form

$$H_{\lambda_1 \lambda \lambda_2}^{\text{odd}}(\theta_1, \theta_2, \phi) = \sum_{q=0}^{2\lambda} 2^{\frac{1}{2}} \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle \left[\frac{(\lambda-q)! (\lambda_2-q)!}{(\lambda+q)! (\lambda_2+q)!} \right]^{\frac{1}{2}} \times P_{\lambda}^q(\cos \theta_1) P_{\lambda_2}^q(\cos \theta_2) \sin q\phi. \quad (34)$$

The "odd" angular function $H_{\lambda_1 \lambda \lambda_2}^{\text{odd}}(\theta_1, \theta_2, \phi)$ gives a contribution to the directional correlation only if the generalized distribution coefficient $A_{\lambda_2 \lambda_2}^{\lambda_1 \lambda_2}(\gamma_1)$ has a nonvanishing imaginary term caused, for instance, by violations of time-reversal invariance or, in beta decay, by Coulomb interference terms. In the following, this odd term is neglected.

B. Normal Geometries. We define as a normal geometry any geometry for which at least one of the angles θ_1 , θ_2 or ϕ is equal to $\pm \pi/2$. In this case, the associated Legendre polynomials with $q = \text{odd}$ vanish, because

$$P_{\lambda}^q(\theta = \pi/2) = \frac{(-1)^{(\lambda+q)/2} (\lambda+q)!}{(\lambda-q)! (\lambda+q)!} \quad \text{for } \lambda + q = \text{even}$$

$$P_{\lambda}^q(\theta = \pi/2) = 0 \quad \text{for } \lambda + q = \text{odd}$$

$$\cos(q\pi/2) = 0 \quad \text{for } q = \text{odd}. \quad (35)$$

Because we restrict ourselves in this section to the emission of parity-conserving radiation from nuclear states of pure parity, $\lambda = \text{even}$. Hence, only $q = \text{even}$, $\lambda = \text{even}$ associated Legendre polynomials are nonvanishing, and these can be expanded in terms of ordinary Legendre polynomials.

$$P_{\lambda}^{q=\text{even}}(\cos \theta) = \sum_{\Lambda=0}^{\lambda} a_{\Lambda}(\lambda, q) P_{\Lambda}(\cos \theta). \quad (36)$$

The expansion coefficients $a_{\Lambda}(\lambda, q)$ are tabulated in Appendix D.

The angular function for any of the normal geometries can now be written in the form

$$H_{\lambda_1 \lambda_2}^{\lambda_1 \lambda_2}(\theta_1, \theta_2, \varphi) = \sum_{\Lambda} g_{\Lambda}^{\lambda_1 \lambda_2} P_{\Lambda}(\cos \theta) \quad (37)$$

where θ is the variable angle of the set θ_1, θ_2 , or ϕ and the two remaining angles are fixed, one of them being equal to $\pm \pi/2$.

The geometrical coefficients $g_{\Lambda}^{\lambda_1 \lambda_2}$ are easily computed from Eqs. (35) to (37) for the four normal geometries.

1. Geometry N1. $\theta_1 = \pi/2$, $\phi = \text{Fixed Arbitrary}$, $\theta_2 = \theta = \text{Variable}$.

$$g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_1 = \pi/2, \varphi) = \sum_{q=\text{even} \geq 0}^{\lambda'} (2 - \delta_{q0}) \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle (-1)^{(\lambda+q)/2} \frac{[(\lambda-q)! (\lambda+q)!]^{\frac{1}{2}}}{(\lambda-q)! (\lambda+q)!} \left[\frac{(\lambda_2 - q)!}{(\lambda_2 + q)!} \right]^{\frac{1}{2}} a_{\Lambda}(\lambda_2, q) \cos q\varphi. \quad (38)$$

2. Geometry N2. $\theta_2 = \pi/2$, $\phi = \text{Fixed Arbitrary}$, $\theta_1 = \theta = \text{Variable}$.

$$g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_2 = \pi/2, \varphi) = \sum_{q=\text{even} \geq 0}^{\lambda'} (2 - \delta_{q0}) \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle (-1)^{(\lambda_2+q)/2} \frac{[(\lambda_2 - q)! (\lambda_2 + q)!]^{\frac{1}{2}}}{(\lambda_2 - q)! (\lambda_2 + q)!} \left[\frac{(\lambda - q)!}{(\lambda + q)!} \right]^{\frac{1}{2}} a_{\Lambda}(\lambda, q) \cos q\varphi. \quad (39)$$

The geometrical coefficients $g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_2 = \pi/2, \phi)$ are easily obtained from the coefficients $g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_1 = \pi/2, \phi)$ through the symmetry relation

$$g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_2 = \pi/2, \varphi) = \left(\frac{2\lambda+1}{2\lambda_2+1} \right)^{\frac{1}{2}} g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_1 = \pi/2, \varphi). \quad (40)$$

3. Geometry Nφ1. $\phi = \pi/2$, $\theta_1 = \text{Fixed Arbitrary}$, $\theta_2 = \theta = \text{Variable}$.

$$g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_1, \varphi = \pi/2) = \sum_{q=\text{even} \geq 0}^{\lambda'} (2 - \delta_{q0}) \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle (-1)^{q/2} \left[\frac{(\lambda - q)! (\lambda_2 - q)!}{(\lambda + q)! (\lambda_2 + q)!} \right]^{\frac{1}{2}} a_{\Lambda}(\lambda_2, q) P_{\Lambda}^q(\cos \theta_1). \quad (41)$$

4. Geometry Nφ2. $\phi = \pi/2$, $\theta_2 = \text{Fixed Arbitrary}$, $\theta_1 = \theta = \text{Variable}$.

$$g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_2, \varphi = \pi/2) = \sum_{q=\text{even} \geq 0}^{\lambda'} (2 - \delta_{q0}) \langle \lambda_1 0 \lambda_2 q | \lambda q \rangle (-1)^{q/2} \left[\frac{(\lambda - q)! (\lambda_2 - q)!}{(\lambda + q)! (\lambda_2 + q)!} \right]^{\frac{1}{2}} a_{\Lambda}(\lambda, q) P_{\Lambda}^q(\cos \theta_2), \quad (42)$$

The geometrical coefficients $g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_2, \phi = \pi/2)$ are obtained from the coefficients $g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_1, \phi = \pi/2)$ with θ_1 replaced by θ_2 as follows.

$$g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_2, \varphi = \pi/2) = \left(\frac{2\lambda+1}{2\lambda_2+1} \right)^{\frac{1}{2}} g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_1 = \theta_2, \varphi = \pi/2). \quad (43)$$

Numerical values of the geometrical coefficients $g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_1 = \pm \pi/2, \phi)$ and $g_{\Lambda}^{\lambda_1 \lambda_2}(\theta_2 = \pm \pi/2, \phi)$ for $\phi = 0$ (or $\phi = \pi$) and for $\phi = \pm \pi/2$ are tabulated in Appendix E.

For any of the normal geometries, the directional correlation of two successive radiations X_1 and X_2 that are emitted from an axially symmetric oriented nuclear state I_1 can now be expressed simply in the form

$$W^{\pm}(\theta_1, \theta_2, \varphi) = \sum_{\Lambda} \Gamma_{\Lambda} P_{\Lambda}(\cos \theta), \quad (44)$$

where θ has the same meaning as in Eq. (37). The directional distribution coefficient Γ_Λ depends, of course, on the pair of fixed angles among the set $(\theta_1, \theta_2, \phi)$, on the orientation of the initial state I_1 , and on the type and multipole character of radiations X_1 and X_2 . Again, all angles are referred to the orientation axis $\vec{z}$ of the initial nuclear state I_1 .

The normalized ($\Gamma_0 = 1$) distribution coefficient is explicitly.

$$\Gamma_\Lambda = \frac{\sum_{\lambda_1 \lambda_2} B_{\lambda_1}(I_1) A_{\lambda_1}^{\lambda_2 \lambda_1}(X_1) A_{\lambda_2}(X_2) g_{\Lambda}^{\lambda_1 \lambda_2}}{\sum_{\lambda_1 \lambda_2} B_{\lambda_1}(I_1) A_{\lambda_1}^{\lambda_2 \lambda_1}(X_1) A_{\lambda_2}(X_2) g_0^{\lambda_1 \lambda_2}} \quad (45)$$

The directional distribution coefficients Γ_Λ for mixed multipole gamma transitions are discussed in detail in Sec. 4.

C. Parallel Geometries. We define as a parallel geometry any geometry in which either $\vec{k}_1$ or $\vec{k}_2$ is parallel to the orientation axis $\vec{z}$; i.e., either $\theta_1 = 0, \pi$ or $\theta_2 = 0, \pi$. The angle ϕ is then undefined and can be set equal to zero. Because in a parallel geometry the situation corresponds to the emission of the nonparallel radiation from an axially symmetric oriented state, the directional correlation can be expressed as a series of ordinary Legendre polynomials,

$$W^{\parallel}(\theta_1, \theta_2, 0) = \sum_{\Lambda} \Xi_{\Lambda} P_{\Lambda}(\cos \theta), \quad (46)$$

where the variable angle θ is the angle θ_1 or θ_2 that is not 0 or π .

1. Geometry P1. $\theta_1 = 0$ or $\theta_1 = \pi$, $\theta_2 = \theta = \text{Variable}$. In this case, the spherical harmonics $Y_{\lambda q}(0, 0)$ or $Y_{\lambda q}(\pi, 0)$ in Eq. (9) vanish for $q \neq 0$.

$$Y_{\lambda q}(0, 0) = \left(\frac{2\lambda+1}{4\pi} \right)^{\frac{1}{2}} \delta_{q0},$$

and for $q = 0$

$$Y_{\lambda_2 q}(\theta_2, 0) = \left(\frac{2\lambda_2+1}{4\pi} \right)^{\frac{1}{2}} P_{\lambda_2}(\cos \theta_2). \quad (47)$$

This relation implies that $\lambda_2 \equiv \Lambda$. Hence, the normalized distribution coefficient $\Xi_{\Lambda}(\theta_1 = 0)$ is

$$\Xi_{\Lambda}(\theta_1 = 0) = \frac{\sum_{\lambda_1 \lambda} B_{\lambda_1}(I_1) A_{\lambda}^{\lambda_1 \lambda}(X_1) A_{\Lambda}(X_2) \langle \lambda_1 0 \lambda 0 | \lambda 0 \rangle}{\sum_{\lambda} B_{\lambda}(I_1) A_{\lambda}(X_1)} \quad (48)$$

where we have used Eq. (20a) and the fact that $A_0(X_2) = 1$.

2. Geometry P2. $\theta_2 = 0$ or $\theta_2 = \pi$, $\theta_1 = \theta = \text{Variable}$. In this case

$$Y_{\lambda_2 q}(0, 0) = \left(\frac{2\lambda_2+1}{4\pi} \right)^{\frac{1}{2}} \delta_{q0}, \quad (49)$$

and for $q = 0$

$$Y_{\lambda q}(\theta_1, 0) = \left(\frac{2\lambda+1}{4\pi} \right)^{\frac{1}{2}} P_{\lambda}(\cos \theta_1); \quad (50)$$

hence, $\Lambda \equiv \lambda$. The distribution coefficient $\Xi_{\Lambda}(\theta_2 = 0)$ is therefore given by

$$\Xi_{\Lambda}(\theta_2 = 0) = \frac{\sum_{\lambda_1 \lambda_2} B_{\lambda_1}(I_1) A_{\Lambda}^{\lambda_2 \lambda_1}(X_1) A_{\lambda_2}(X_2) \langle \lambda_1 0 \lambda_2 0 | \lambda 0 \rangle}{\sum_{\lambda_1} B_{\lambda_1}(I_1) U_{\lambda_1 \lambda_1}(X_1) A_{\lambda_1}(X_2)} \quad (51)$$

where we have used Eqs. (20c) and (31).

D. Unrestricted Plane Geometry. Experimentally, the unrestricted plane geometry, in which the orientation axis $\vec{z}$ is in the same plane as the two detector axes $\vec{k}_1$ and $\vec{k}_2$, is particularly convenient (see Fig. F-1, Appendix F), although the DCO function must be expressed in the general form (Eq. 24) if one of the angles θ_1 and θ_2 is not a multiple of $\pi/2$ (including zero).

Geometry UP1: $\phi = 0$ or $\phi = \pi$, $\theta_1 = \text{fixed arbitrary}$
 $\theta_2 = \text{variable}$ (see Fig. F-1)

Geometry UP2: $\phi = 0$ or $\phi = \pi$, $\theta_2 = \text{fixed arbitrary}$
 $\theta_1 = \text{variable}$ (see Fig. F-1)

Note that the cases $\phi = 0$ and $\phi = \pi$ are not identical, but differ in the direction in which θ_2 is measured relative to the axis of orientation.

IV. Discussion

In the following discussion, the equivalent phenomena of a gamma-gamma directional correlation of two radiations γ_1 and γ_2 emitted from an axially symmetric oriented initial nuclear state I_1 , and of a triple directional correlation between three gamma radiations γ_0 , γ_1 , and γ_2 that are emitted in cascade from an unoriented initial state I_0 are both referred to as DCO (Directional Correlation from Oriented Nuclei).

A general discussion of DCO measurements with particular emphasis on their dependence on multipole mixing ratios δ is difficult because of the many parameters involved. Therefore, we will discuss only a few practical cases using typical geometries (see Fig. F-1) and orientation parameters as an illustration of the sensitivity of the DCO to the mixing ratios δ .

All of these examples involve DCO measurements on axially symmetric oriented nuclear states formed in nuclear reactions and Coulomb excitation processes. The generalization to nuclear states that are oriented by cryogenic methods or by the observation of a preceding radiation is obvious.

Figures F-2 and F-3 show the normalized DCO coefficient, $\Gamma_\Lambda(\delta_1)$ and $\Xi_\Lambda(\delta_1)$ of the ordinary Legendre polynomials $P_\Lambda(\cos \theta)$ in the DCO functions $W(\theta_2; \theta_1 = \pm \pi/2, \phi = 0)$, $W(\theta_1; \theta_2 = \pm \pi/2, \phi = 0)$, $W(\theta_2; \theta_1 = 0)$, and $W(\theta_1; \theta_2 = 0)$ in the N1($\phi = 0$), N2($\phi = 0$), P1, and P2 geometries, respectively, as a function of the mixing ratio δ_1 in a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade where the orientation parameters of the initial state are $B_2(2') = -0.40$ and $B_4(2') = 0.02$. These are typical values in a Coulomb excitation experiment in which the scattered ion is not observed. Note that $\Gamma_\Lambda(\delta_1)$ and $\Xi_\Lambda(\delta_1)$ do not vanish for $\delta_1 \rightarrow 0$ in the N1 and P1 geometries. For comparison, the distribution coefficient $B_\lambda(2') A_\lambda(\delta_1)$ of the *ordinary directional distribution* of γ_1 is plotted for the same situation in Fig. F-4 (solid curves). It is obvious that the DCO is more sensitive to the mixing ratio δ_1 and the anisotropies are larger. Also, the extraction of δ_1 is less sensitive to an accurate knowledge of $B_\lambda(I_1)$.

Figure F-5 shows the DCO coefficients $\Gamma_\Lambda(\delta_1, \delta_2)$ and $\Xi_\Lambda(\delta_1, \delta_2)$ for the P1 and N1 geometries for a $11/2 \xrightarrow{\delta_1} 9/2 \xrightarrow{\delta_2} 7/2$ cascade in which both gamma transitions are mixed dipole-quadrupole radiations. The chosen orientation parameters $B_2(11/2) = -0.092$ and $B_4(11/2) = 0$ are typical for Coulomb excitation of the $11/2$ state without observation of the scattered ion.

For *unrestricted plane geometries* in which $\phi = 0$ or π and θ_1 and θ_2 are arbitrary, the DCO function cannot be expressed in terms of ordinary Legendre polynomials. Figures F-6 and F-7 show the DCO functions in the UP1

and UP2 geometries, respectively, for the same cascade and the same initial nuclear state orientation as above [$B_2(2') = -0.40$ and $B_4(2') = 0.02$] for various choices of θ_1 and θ_2 , respectively, and for a mixing ratio $\delta_1 = 1$. The DCO functions are sensitive to the value of δ_1 and the choice of the fixed angle of either θ_1 or θ_2 . As an illustration of this sensitivity, the ratio

$$R = \frac{W(\delta_1; \theta_1 = \alpha, \theta_2 = \beta, \phi = 0)}{W(\delta_1; \theta_1 = \beta, \theta_2 = \alpha, \phi = 0)} \quad (52)$$

is plotted in Fig. F-8 as a function of the angle β and in Figs. F-9 and F-10 as a function of the mixing ratio δ_1 in the $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ transition of a $2' \rightarrow 2 \rightarrow 0$ cascade. For $\alpha = 0$, $\beta = \pi/2$ the ratio $R(\delta_1)$ is symmetric with respect to δ_1 and δ_1^{-1} (Fig. F-9). This symmetry is lifted for the choice $\alpha = 36^\circ$, $\beta = 72^\circ$ (Fig. F-10). In an actual experiment, the ratios $R(\delta_1)$ at fixed angles θ_1 and θ_2 can all be measured easily and accurately and provide a powerful method for determining the mixing ratio δ_1 .

Figure F-11 shows the distribution parameters $\Gamma_\Lambda(\phi)$ and $\Gamma_\Lambda(\theta)$ for the DCO in the N1, N2, N ϕ 1, and N ϕ 2 geometries for $\delta_1 = 1$. Again, the DCO coefficients are shown for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade and $B_2(2') = -0.40$ and $B_4(2') = 0.02$.

For larger orientation parameters $B_\lambda(I_1)$, the DCO functions are extremely sensitive to the mixing ratio δ_1 , especially near $\delta_1 = 1$. Figures F-12 and F-13 show the DCO distribution coefficients $\Gamma_\Lambda(\delta_1)$ and $\Xi_\Lambda(\delta_1)$ for the N1($\phi = 0$), N2($\phi = 0$), P1, and P2 geometries computed for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade with $B_2(2') = -1.17$ and $B_4(2') = +1.47$. These orientation-parameter values are typical for Coulomb excitation with observation of the backscattered ion in an axially symmetric counter around the beam. Using the same set of orientation parameters $B_\lambda(2')$, the ratios $R(\alpha)$ of the DCO functions $W(\theta_1 = \alpha, \theta_2 = \beta, \phi = 0)$ and its reverse $W(\theta_1 = \beta, \theta_2 = \alpha, \phi = 0)$ in the UP geometry for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade have been computed for $\delta_1 = 1$. The result is shown in Fig. F-14.

The almost "resonance"-like behavior of $R(\alpha)$ near certain α values is remarkable. This type of measurement is very sensitive to δ_1 as is shown in Figs. F-15 and F-16, where the ratio $R(\delta_1)$ of Eq. (52) is plotted for $\alpha = 0$ and $\beta = \pi/2$ and for $\alpha = 36^\circ$ and $\beta = 72^\circ$, respectively.

The possibility of measuring the mixing ratios δ_1 and $\bar{\delta}_1$ of gamma transitions that contain three multipole components, e.g., E1, M2, E3, is explored in Figs. F-17 to F-20. The DCO distribution coefficients $\Gamma_2(\delta_1, \bar{\delta}_1)$ are shown for a $2' \xrightarrow{\delta_1, \bar{\delta}_1} 2 \rightarrow 0$ gamma cascade observed in the N1($\phi = 0$) and N2($\phi = 0$) geometries as a function of δ_1

for various values of $\bar{\delta}_1$. The orientation parameters of the $2'$ state chosen for this example, $B_2(2') = 0.80$ and $B_4(2') = 0.10$, are typical for a cryogenic nuclear-orientation measurement. The $\Gamma_2(\delta_1, \bar{\delta}_1)$ coefficients are quite sensitive to both δ_1 and $\bar{\delta}_1$. As can be seen from these curves, a measurement of the ratios $R(\alpha) = W(\theta_1 = \pi/2, \theta_2 = \alpha, \phi = 0) / W(\theta_1 = \alpha, \theta_2 = \pi/2, \phi = 0)$ can be quite useful in determining the mixing ratios δ_1 and $\bar{\delta}_1$. For a unique determination of δ_1 and $\bar{\delta}_1$, additional information, e.g., the results of ordinary directional correlation experiments, is required.

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APPENDIX A

TABLES OF SPHERICAL HARMONICS AND LEGENDRE POLYNOMIALS

The spherical harmonics can be defined by

$$Y_{\lambda q}(\theta, \varphi) = (-1)^{\frac{1}{2}(|q|+q)} \left[\frac{(2\lambda+1)(\lambda-|q|)!}{4\pi(\lambda+|q|)!} \right]^{\frac{1}{2}} \\ \times P_{\lambda}^{|q|}(\cos \theta) e^{iq\varphi},$$

where the associated Legendre polynomial, $P_{\lambda}^{|q|}(x)$, is defined by

$$P_{\lambda}^q(x) = (1-x^2)^{\frac{q}{2}} \frac{d^q P_{\lambda}(x)}{dx^q} \quad q \geq 0.$$

The function $P_{\lambda}(x)$ is a Legendre polynomial.

$$P_{\lambda}(x) = \frac{1}{2^{\lambda} \lambda!} \frac{d^{\lambda} (x^2-1)^{\lambda}}{dx^{\lambda}}.$$

Properties of the Legendre Polynomials

$$P_0(x) = 1$$

$$P_{\lambda}(-x) = (-1)^{\lambda} P_{\lambda}(x)$$

$$P_{\lambda}(1) = 1.$$

Orthogonality

$$\int_{-1}^{+1} P_{\lambda}(x) P_{\lambda'}(x) dx = \frac{2\delta_{\lambda\lambda'}}{2\lambda+1}.$$

Explicit Expressions for the $P_{\lambda}(\cos \theta)$

$$P_0(\cos \theta) = 1$$

$$P_1(\cos \theta) = \cos \theta$$

$$P_2(\cos \theta) = \frac{1}{2} (3 \cos^2 \theta - 1)$$

$$P_3(\cos \theta) = \frac{1}{2} (5 \cos^3 \theta - 3 \cos \theta)$$

$$P_4(\cos \theta) = \frac{1}{8} (35 \cos^4 \theta - 30 \cos^2 \theta + 3).$$

Properties of the Associated Legendre Polynomials

$$P_{\lambda}^{-q}(x) = (-1)^q \frac{(\lambda-q)!}{(\lambda+q)!} P_{\lambda}^q(x) \quad q > 0$$

$$P_{\lambda}^q(-x) = (-1)^{\lambda-q} P_{\lambda}^q(x)$$

$$P_{\lambda}^q(0) = 0 \quad \lambda + q = \text{odd}$$

$$P_{\lambda}^q(0) = (-1)^{\frac{1}{2}(\lambda+q)} \frac{(\lambda+q)!}{(\lambda-q)! (\lambda+q)!} \quad \lambda + q = \text{even}$$

$$P_{\lambda}^q(1) = \delta_{q0}$$

$$P_{\lambda}^0(x) = P_{\lambda}(x) .$$

Orthogonality

$$\int_{-1}^{+1} P_{\lambda}^q(x) P_{\lambda'}^q(x) dx = \frac{2\delta_{\lambda\lambda'}}{2\lambda+1} \frac{(\lambda+q)!}{(\lambda-q)!}$$

Explicit Expressions for the $P_{\lambda}^q(\cos \theta)$

$$P_0^0(\cos \theta) = 1$$

$$P_2^0(\cos \theta) = -\frac{1}{2} + \frac{3}{2} \cos^2 \theta$$

$$P_2^1(\cos \theta) = 3 \cos \theta \sin \theta$$

$$P_2^2(\cos \theta) = 3 \sin^2 \theta$$

$$P_4^0(\cos \theta) = \frac{3}{8} - \frac{30}{8} \cos^2 \theta + \frac{35}{8} \cos^4 \theta$$

$$P_4^1(\cos \theta) = \left(-\frac{15}{2} \cos \theta + \frac{35}{2} \cos^3 \theta\right) \sin \theta$$

$$P_4^2(\cos \theta) = \left(-\frac{15}{2} + \frac{105}{2} \cos^2 \theta\right) \sin^2 \theta$$

$$P_4^3(\cos \theta) = 105 \cos \theta \sin^3 \theta$$

$$P_4^4(\cos \theta) = 105 \sin^4 \theta .$$

Properties of the Spherical Harmonics

$$Y_{\lambda q}(0,0) = \left(\frac{2\lambda+1}{4\pi}\right)^{\frac{1}{2}} \delta_{q0}$$

$$Y_{\lambda 0}(\theta, \varphi) = \left(\frac{2\lambda+1}{4\pi}\right)^{\frac{1}{2}} P_{\lambda}(\cos \theta) .$$

$$Y_{\lambda q}^*(\theta, \varphi) = (-1)^q Y_{\lambda -q}(\theta, \varphi) .$$

$$Y_{\lambda q}(\pi - \theta, \varphi + \pi) = (-1)^{\lambda} Y_{\lambda q}(\theta, \varphi) .$$

Orthonormality

$$\int_{\theta=0}^{\pi} \int_{\varphi=0}^{2\pi} Y_{\lambda q}^*(\theta, \varphi) Y_{\lambda' q'}(\theta, \varphi) \sin \theta d\theta d\varphi = \delta_{\lambda\lambda'} \delta_{qq'} .$$

Addition Theorem of Spherical Harmonics

$$\sum_q \frac{4\pi}{2\lambda+1} Y_{\lambda q}(\theta_1, \varphi_1) Y_{\lambda q}^*(\theta_2, \varphi_2) = P_{\lambda}(\cos \theta) ,$$

where θ is the angle between the directions (θ_1, φ_1) and (θ_2, φ_2) .

Explicit Expressions for the Spherical Harmonics

$$Y_{00}(\theta, \varphi) = \sqrt{\frac{1}{4\pi}}$$

$$Y_{10}(\theta, \varphi) = \frac{1}{2} \sqrt{\frac{3}{\pi}} \cos \theta$$

$$Y_{1\pm 1}(\theta, \varphi) = \mp \frac{1}{2} \sqrt{\frac{3}{2\pi}} \sin \theta e^{\pm i\varphi}$$

$$Y_{20}(\theta, \varphi) = \frac{1}{4} \sqrt{\frac{5}{\pi}} (3 \cos^2 \theta - 1)$$

$$Y_{2\pm 1}(\theta, \varphi) = \mp \frac{1}{2} \sqrt{\frac{15}{2\pi}} \cos \theta \sin \theta e^{\pm i\varphi}$$

$$Y_{2\pm 2}(\theta, \varphi) = \frac{1}{4} \sqrt{\frac{15}{2\pi}} (1 - \cos^2 \theta) e^{\pm 2i\varphi}$$

$$Y_{30}(\theta, \varphi) = \frac{1}{4} \sqrt{\frac{7}{\pi}} (5 \cos^3 \theta - 3 \cos \theta) .$$

$$Y_{3\pm 1}(\theta, \varphi) = \mp \frac{1}{8} \sqrt{\frac{21}{\pi}} (5 \cos^2 \theta - 1) \sin \theta e^{\pm i\varphi}$$

$$Y_{3\pm 2}(\theta, \varphi) = \frac{1}{4} \sqrt{\frac{105}{2\pi}} \cos \theta (1 - \cos^2 \theta) e^{\pm 2i\varphi}$$

$$Y_{3\pm 3}(\theta, \varphi) = \mp \frac{1}{8} \sqrt{\frac{35}{\pi}} \sin^3 \theta e^{\pm 3i\varphi}$$

$$Y_{40}(\theta, \varphi) = \frac{3}{16} \sqrt{\frac{1}{\pi}} (35 \cos^4 \theta - 30 \cos^2 \theta + 3) .$$

$$Y_{4\pm 1}(\theta, \varphi) = \mp \frac{3}{8} \sqrt{\frac{5}{\pi}} \sin \theta (7 \cos^3 \theta - 3 \cos \theta) e^{\pm i\varphi}$$

$$Y_{4\pm 2}(\theta, \varphi) = -\frac{3}{8} \sqrt{\frac{5}{2\pi}} (7 \cos^4 \theta - 8 \cos^2 \theta + 1) e^{\pm 2i\varphi}$$

$$Y_{4\pm 3}(\theta, \varphi) = \mp \frac{3}{8} \sqrt{\frac{35}{\pi}} \sin \theta (\cos \theta - \cos^3 \theta) e^{\pm 3i\varphi}$$

$$Y_{4\pm 4}(\theta, \varphi) = \frac{3}{16} \sqrt{\frac{35}{2\pi}} \sin^4 \theta e^{\pm 4i\varphi}$$

APPENDIX B

TABLE OF CLEBSCH-GORDAN COEFFICIENTS

$\langle \lambda_1 \ 0 \ \lambda_2 \ q \ \ \lambda \ q \rangle$							
λ_1	λ_2	λ	$q = 0$	$q = 1$	$q = 2$	$q = 3$	$q = 4$
2	2	0	0.4472	0.0000	0.0000	0.0000	0.0000
0	2	2	1.0000	1.0000	1.0000	0.0000	0.0000
2	2	2	- 0.5345	- 0.2673	0.5345	0.0000	0.0000
2	2	4	0.7171	0.6547	0.4629	0.0000	0.0000
4	4	0	0.3333	0.0000	0.0000	0.0000	0.0000
2	4	2	0.5345	0.4880	0.3450	0.0000	0.0000
4	4	2	- 0.3799	- 0.1040	0.4414	0.0000	0.0000
0	4	4	1.0000	1.0000	1.0000	1.0000	1.0000
2	4	4	- 0.5096	- 0.4332	- 0.2039	0.1784	0.7135
4	4	4	0.4023	0.2011	- 0.2458	- 0.4693	0.3129

APPENDIX C

TABLE OF GENERALIZED F-COEFFICIENTS

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 1$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
1	1	2	0	2	-0.3536	1.0607	0.0000	-0.3536	0.0000	0.0000
1	1	2	2	0	-1.1180	0.0000	0.0000	0.2236	0.0000	0.0000
1	1	2	2	2	0.9354	0.0000	0.0000	0.1336	0.0000	0.0000
1	1	2	2	4	0.0000	0.0000	0.0000	-1.4343	0.0000	0.0000

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 3/2$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
3/2	3/2	2	0	2	-0.4000	0.7746	0.4899	0.0000	0.6325	-0.6000
3/2	3/2	2	2	0	0.4472	0.0000	0.0000	-1.3416	0.0000	0.4472
3/2	3/2	2	2	2	0.7483	0.0000	1.0474	-0.5345	0.0000	0.3207
3/2	3/2	2	2	4	0.0000	0.0000	-0.5855	-0.9562	0.0000	0.2390

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 2$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
1	2	2	0	2	0.0707	-0.4743	0.8485	0.3536	0.6325	-0.4243
1	2	2	2	0	1.3229	0.0000	0.0000	-1.3229	0.0000	0.3780
1	2	2	2	2	-0.1581	0.7071	1.0390	-0.5647	-0.1010	0.2711
1	2	2	2	4	0.0000	0.0000	0.3030	0.4041	-1.1294	0.2020
1	2	2	4	2	1.2728	0.9487	0.1212	0.3030	-0.1355	-0.0606
1	2	2	4	4	0.0000	0.0000	0.7946	-1.4126	-0.1974	-0.0321
2	2	2	0	2	-0.4183	0.6124	0.5855	0.1281	0.5714	-0.1793
2	2	2	2	0	1.1180	0.0000	0.0000	-0.4792	0.0000	-1.2778
2	2	2	2	2	0.6682	0.0000	0.4676	-0.5591	0.0000	-0.5727
2	2	2	2	4	0.0000	0.0000	-0.6274	-0.8293	0.0000	0.1707
2	2	2	4	2	-0.3586	-1.2247	-0.5437	-0.6220	0.6429	0.4866
2	2	2	4	4	0.0000	0.0000	0.2742	0.5117	0.9364	0.1628
2	2	4	0	4	0.0000	0.0000	-0.3273	-0.3054	0.7986	-0.1336
2	2	4	2	2	-0.3586	1.2247	-0.5437	-0.6220	-0.6429	0.4866
2	2	4	2	4	0.0000	0.0000	0.2742	0.5117	-0.9364	0.1628
2	2	4	4	0	-2.0000	0.0000	0.0000	0.8571	0.0000	-0.2143
2	2	4	4	2	1.2536	0.0000	-0.6580	0.3837	0.0000	-0.1343
2	2	4	4	4	0.0000	0.0000	1.1184	-1.5654	0.0000	-0.0623

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 5/2$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
3/2	5/2	2	0	2	0.1000	-0.5916	0.8000	0.3571	0.3381	0.1500
3/2	5/2	2	2	0	1.6733	0.0000	0.0000	-0.2390	0.0000	-1.3148
3/2	5/2	2	2	2	-0.2000	0.8452	0.4000	-0.4694	0.1207	-0.6214
3/2	5/2	2	2	4	0.0000	0.0000	0.3354	0.4381	-1.0124	0.0958
3/2	5/2	2	4	2	1.0392	-0.2928	-0.3464	-0.5302	0.6901	0.6310
3/2	5/2	2	4	4	0.0000	0.0000	-0.0000	-0.9886	0.3655	0.1966
5/2	5/2	2	0	2	-0.4276	0.5071	0.6299	0.1909	0.4980	0.0267
5/2	5/2	2	2	0	1.4694	0.0000	0.0000	0.2236	0.0000	-0.9264
5/2	5/2	2	2	2	0.6262	-0.0000	0.0900	-0.5291	0.0000	-0.7407
5/2	5/2	2	2	4	0.0000	0.0000	-0.6371	-0.7757	-0.0000	0.1451
5/2	5/2	2	4	2	-0.4761	-1.3175	-0.1645	-0.4251	-0.0958	-0.5489
5/2	5/2	2	4	4	0.0000	0.0000	0.3784	0.5945	0.8376	0.0525
5/2	5/2	4	0	4	0.0000	0.0000	-0.4041	-0.3968	0.7986	-0.0772
5/2	5/2	4	2	2	-0.4761	1.3175	-0.1645	-0.4251	0.0958	-0.5489
5/2	5/2	4	2	4	0.0000	0.0000	0.3784	0.5945	-0.8376	0.0525
5/2	5/2	4	4	0	-0.4286	0.0000	0.0000	-1.5000	0.0000	1.3571
5/2	5/2	4	4	2	1.0745	-0.0000	1.0551	-0.3837	0.0000	0.7163
5/2	5/2	4	4	4	0.0000	0.0000	0.2989	-1.1740	0.0000	0.1868

$$F_{\lambda}^{\lambda_2 \lambda_1}(L L' l_2 l_1) \text{ for } l_1 = 3$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
1	3	2	0	2	0.0000	0.0000	0.0000	- 0.1010	- 0.3780	0.5303
1	3	2	2	0	0.0000	0.0000	0.0000	1.0954	0.0000	- 1.3693
1	3	2	2	2	0.0000	0.0000	0.0000	0.1870	0.4374	- 0.7365
1	3	2	2	4	0.0000	0.0000	0.0000	- 0.0558	0.3260	- 0.1220
1	3	2	4	2	0.0000	0.0000	0.0000	- 0.7598	0.7107	0.6648
1	3	2	4	4	0.0000	0.0000	0.0000	0.1610	- 0.5459	0.2177
2	3	2	0	2	0.1195	- 0.6547	0.7667	0.3415	0.1750	0.3287
2	3	2	2	0	1.8516	0.0000	0.0000	0.4629	0.0000	- 0.8487
2	3	2	2	2	- 0.2213	0.9091	0.0591	- 0.3952	0.2295	- 0.7239
2	3	2	2	4	0.0000	0.0000	0.3527	0.4477	- 0.9558	0.0619
2	3	2	4	2	0.8990	- 0.8207	- 0.2403	- 0.6421	0.2193	- 0.3371
2	3	2	4	4	0.0000	0.0000	- 0.2386	- 0.8163	0.5228	0.1623
2	3	4	0	4	0.0000	0.0000	0.0714	0.0764	- 0.3260	0.0891
2	3	4	2	2	0.0495	- 0.3614	0.6040	0.3358	0.7305	- 0.8124
2	3	4	2	4	0.0000	0.0000	- 0.0867	- 0.1236	0.4485	- 0.1245
2	3	4	4	0	1.2536	0.0000	0.0000	- 1.8803	0.0000	1.2536
2	3	4	4	2	- 0.1429	0.5868	1.3745	- 0.6122	- 0.1568	0.6786
2	3	4	4	4	0.0000	0.0000	0.0487	0.3122	- 0.6664	0.1987
3	3	2	0	2	- 0.4330	0.4330	0.6547	0.2268	0.4364	0.1443
3	3	2	2	0	1.6771	0.0000	0.0000	0.7081	0.0000	- 0.3727
3	3	2	2	2	0.6013	- 0.0000	- 0.1515	- 0.4995	- 0.0000	- 0.7572
3	3	2	2	4	0.0000	0.0000	- 0.6400	- 0.7475	- 0.0000	0.1328
3	3	2	4	2	- 0.5428	- 1.2666	0.1368	- 0.2326	- 0.4787	- 0.7237
3	3	2	4	4	0.0000	0.0000	0.4401	0.6243	0.7227	- 0.0052
3	3	4	0	4	0.0000	0.0000	- 0.4432	- 0.4467	0.7387	- 0.0355
3	3	4	2	2	- 0.5428	1.2666	0.1368	- 0.2326	0.4787	- 0.7237
3	3	4	2	4	0.0000	0.0000	0.4401	0.6243	- 0.7227	- 0.0052
3	3	4	4	0	0.5000	0.0000	0.0000	- 1.5000	0.0000	- 0.5000
3	3	4	4	2	0.9687	- 0.0000	1.1630	- 0.6105	0.0000	0.0285
3	3	4	4	4	0.0000	0.0000	- 0.0549	- 0.9961	0.0000	0.1981

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' L_2 L_1) \text{ for } L_1 = 7/2$$

L_2	L_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
3/2	7/2	2	0	2	0.0000	0.0000	0.0000	-0.1429	-0.4629	0.5000
3/2	7/2	2	2	0	0.0000	0.0000	0.0000	1.4639	0.0000	-0.4880
3/2	7/2	2	2	2	0.0000	0.0000	0.0000	0.2499	0.5399	-0.5832
3/2	7/2	2	2	4	0.0000	0.0000	0.0000	-0.0745	0.4025	-0.1304
3/2	7/2	2	4	2	0.0000	0.0000	0.0000	-0.8615	0.3102	-0.3350
3/2	7/2	2	4	4	0.0000	0.0000	0.0000	0.1825	-0.6408	0.1839
5/2	7/2	2	0	2	0.1336	-0.6944	0.7423	0.3245	0.0714	0.4009
5/2	7/2	2	2	0	1.9562	0.0000	0.0000	0.9129	0.0000	-0.2608
5/2	7/2	2	2	2	-0.2338	0.9449	-0.1443	-0.3451	0.2916	-0.7014
5/2	7/2	2	2	4	0.0000	0.0000	0.3630	0.4514	-0.9237	0.0465
5/2	7/2	2	4	2	0.8059	-1.0856	-0.0829	-0.6012	-0.1675	-0.7163
5/2	7/2	2	4	4	0.0000	0.0000	-0.3359	-0.7264	0.5945	0.1276
5/2	7/2	4	0	4	0.0000	0.0000	0.1071	0.1176	-0.4468	0.1029
5/2	7/2	4	2	2	0.0810	-0.5455	0.8082	0.4435	0.7576	-0.5130
5/2	7/2	4	2	4	0.0000	0.0000	-0.1311	-0.1798	0.5886	-0.1316
5/2	7/2	4	4	0	1.7409	0.0000	0.0000	-1.3540	0.0000	-0.7737
5/2	7/2	4	4	2	-0.1984	0.8018	1.1633	-0.6456	-0.0412	-0.1323
5/2	7/2	4	4	4	0.0000	0.0000	0.1171	0.3854	-0.7886	0.1533
7/2	7/2	2	0	2	-0.4364	0.3780	0.6701	0.2494	0.3869	0.2182
7/2	7/2	2	2	0	1.8102	0.0000	0.0000	1.0435	0.0000	0.1065
7/2	7/2	2	2	2	0.5854	-0.0000	-0.3126	-0.4763	-0.0000	-0.7382
7/2	7/2	2	2	4	0.0000	0.0000	-0.6408	-0.7307	-0.0000	0.1259
7/2	7/2	2	4	2	-0.5849	-1.1819	0.3537	-0.0836	-0.6598	-0.6380
7/2	7/2	2	4	4	0.0000	0.0000	0.4800	0.6373	0.6291	-0.0369
7/2	7/2	4	0	4	0.0000	0.0000	-0.4666	-0.4775	0.6734	-0.0069
7/2	7/2	4	2	2	-0.5849	1.1819	0.3537	-0.0836	0.6598	-0.6380
7/2	7/2	4	2	4	0.0000	0.0000	0.4800	0.6373	-0.6291	-0.0369
7/2	7/2	4	4	0	1.0952	0.0000	0.0000	-1.0000	0.0000	-1.3117
7/2	7/2	4	4	2	0.9008	-0.0000	0.9362	-0.6745	-0.0000	-0.4470
7/2	7/2	4	4	4	0.0000	0.0000	-0.2394	-0.9013	0.0000	0.1818

$$F_{\lambda}^{\lambda_2 \lambda_1} (L, L', l_2, l_1) \text{ for } l_1 = 4$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
1	4	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.1768
1	4	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.9910
1	4	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.2961
1	4	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0241
1	4	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.9060
1	4	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0524
2	4	2	0	2	0.0000	0.0000	0.0000	- 0.1707	- 0.5051	0.4482
2	4	2	2	0	0.0000	0.0000	0.0000	1.6751	0.0000	0.1675
2	4	2	2	2	0.0000	0.0000	0.0000	0.2860	0.5923	- 0.4505
2	4	2	2	4	0.0000	0.0000	0.0000	- 0.0853	0.4414	- 0.1316
2	4	2	4	2	0.0000	0.0000	0.0000	- 0.8751	- 0.0000	- 0.7657
2	4	2	4	4	0.0000	0.0000	0.0000	0.1854	- 0.6719	0.1622
2	4	4	0	4	0.0000	0.0000	0.0000	- 0.0085	0.0627	- 0.0297
2	4	4	2	2	0.0000	0.0000	0.0000	- 0.0640	- 0.2649	0.4925
2	4	4	2	4	0.0000	0.0000	0.0000	0.0136	- 0.0912	0.0435
2	4	4	4	0	0.0000	0.0000	0.0000	0.8542	0.0000	- 1.7083
2	4	4	4	2	0.0000	0.0000	0.0000	0.1391	0.2879	- 0.7301
2	4	4	4	4	0.0000	0.0000	0.0000	- 0.0327	0.1694	- 0.0833
3	4	2	0	2	0.1443	- 0.7217	0.7237	0.3093	0.0000	0.4330
3	4	2	2	0	2.0229	0.0000	0.0000	1.2138	0.0000	0.2207
3	4	2	2	2	- 0.2418	0.9671	- 0.2755	- 0.3109	0.3307	- 0.6594
3	4	2	2	4	0.0000	0.0000	0.3697	0.4531	- 0.9037	0.0381
3	4	2	4	2	0.7397	- 1.2329	0.0562	- 0.5284	- 0.4215	- 0.8070
3	4	2	4	4	0.0000	0.0000	- 0.3818	- 0.6717	0.6363	0.1030
3	4	4	0	4	0.0000	0.0000	0.1336	0.1489	- 0.5197	0.1044
3	4	4	2	2	0.1071	- 0.6786	0.9198	0.4949	0.6797	- 0.2078
3	4	4	2	4	0.0000	0.0000	- 0.1640	- 0.2184	0.6641	- 0.1252
3	4	4	4	0	2.0442	0.0000	0.0000	- 0.6814	0.0000	- 1.4247
3	4	4	4	2	- 0.2330	0.9318	0.8495	- 0.6101	0.0708	- 0.5612
3	4	4	4	4	0.0000	0.0000	0.1718	0.4177	- 0.8330	0.1152
4	4	2	0	2	- 0.4387	0.3354	0.6803	0.2646	0.3467	0.2678
4	4	2	2	0	1.9007	0.0000	0.0000	1.2821	0.0000	0.4850
4	4	2	2	2	0.5746	0.0000	- 0.4248	- 0.4588	- 0.0000	- 0.7126
4	4	2	2	4	0.0000	0.0000	- 0.6410	- 0.7198	- 0.0000	0.1216
4	4	2	4	2	- 0.6132	- 1.0939	0.5107	0.0284	- 0.7382	- 0.4885
4	4	2	4	4	0.0000	0.0000	0.5072	0.6436	0.5553	- 0.0556
4	4	4	0	4	0.0000	0.0000	- 0.4818	- 0.4981	0.6139	0.0132
4	4	4	2	2	- 0.6132	1.0939	0.5107	0.0284	0.7382	- 0.4885
4	4	4	2	4	0.0000	0.0000	0.5072	0.6436	- 0.5553	- 0.0556
4	4	4	4	0	1.5000	0.0000	0.0000	- 0.4481	0.0000	- 1.4221
4	4	4	4	2	0.8547	0.0000	0.6627	- 0.6834	0.0000	- 0.7049
4	4	4	4	4	0.0000	0.0000	- 0.3480	- 0.8449	0.0000	0.1659

$$F_{\lambda}^{\lambda_2 \lambda_1}(L L' l_2 l_1) \text{ for } l_1 = 9/2$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
3/2	9/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.2500
3/2	9/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.3540
3/2	9/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.4046
3/2	9/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0329
3/2	9/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1299
3/2	9/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0653
5/2	9/2	2	0	2	0.0000	0.0000	0.0000	- 0.1909	- 0.5297	0.4009
5/2	9/2	2	2	0	0.0000	0.0000	0.0000	1.8094	0.0000	0.6251
5/2	9/2	2	2	2	0.0000	0.0000	0.0000	0.3089	0.6235	- 0.3539
5/2	9/2	2	2	4	0.0000	0.0000	0.0000	- 0.0921	0.4647	- 0.1314
5/2	9/2	2	4	2	0.0000	0.0000	0.0000	- 0.8628	- 0.2177	- 0.9334
5/2	9/2	2	4	4	0.0000	0.0000	0.0000	0.1828	- 0.6802	0.1497
5/2	9/2	4	0	4	0.0000	0.0000	0.0000	- 0.0147	0.1019	- 0.0444
5/2	9/2	4	2	2	0.0000	0.0000	0.0000	- 0.1070	- 0.4050	0.6470
5/2	9/2	4	2	4	0.0000	0.0000	0.0000	0.0227	- 0.1444	0.0626
5/2	9/2	4	4	0	0.0000	0.0000	0.0000	1.3048	0.0000	- 1.5420
5/2	9/2	4	4	2	0.0000	0.0000	0.0000	0.2124	0.4287	- 0.8110
5/2	9/2	4	4	4	0.0000	0.0000	0.0000	- 0.0500	0.2522	- 0.1077
7/2	9/2	2	0	2	0.1528	- 0.7416	0.7091	0.2962	- 0.0522	0.4473
7/2	9/2	2	2	0	2.0683	0.0000	0.0000	1.4236	0.0000	0.5909
7/2	9/2	2	2	2	- 0.2472	0.9820	- 0.3651	- 0.2866	0.3569	- 0.6196
7/2	9/2	2	2	4	0.0000	0.0000	0.3742	0.4540	- 0.8902	0.3331
7/2	9/2	2	4	2	0.6904	- 1.3205	0.1700	- 0.4547	- 0.5841	- 0.7801
7/2	9/2	2	4	4	0.0000	0.0000	- 0.4051	- 0.6351	0.6642	0.0855
7/2	9/2	4	0	4	0.0000	0.0000	0.1543	0.1737	- 0.5675	0.1019
7/2	9/2	4	2	2	0.1291	- 0.7787	0.9852	0.5186	0.5781	0.0302
7/2	9/2	4	2	4	0.0000	0.0000	- 0.1894	- 0.2466	0.7093	- 0.1163
7/2	9/2	4	4	0	2.2485	0.0000	0.0000	- 0.0876	0.0000	- 1.4016
7/2	9/2	4	4	2	- 0.2562	1.0178	0.5677	- 0.5633	0.1611	- 0.7587
7/2	9/2	4	4	4	0.0000	0.0000	0.2134	0.4341	- 0.8512	0.0893
9/2	9/2	2	0	2	- 0.4404	0.3015	0.6876	0.2752	0.3138	0.3028
9/2	9/2	2	2	0	1.9650	0.0000	0.0000	1.4568	0.0000	0.7792
9/2	9/2	2	2	2	0.5669	0.0000	- 0.5058	- 0.4454	0.0000	- 0.6884
9/2	9/2	2	2	4	0.0000	0.0000	- 0.6409	- 0.7123	- 0.0000	0.1188
9/2	9/2	2	4	2	- 0.6333	- 1.0118	0.6266	0.1131	- 0.7638	- 0.3367
9/2	9/2	2	4	4	0.0000	0.0000	0.5266	0.6470	0.4965	- 0.0675
9/2	9/2	4	0	4	0.0000	0.0000	- 0.4924	- 0.5125	0.5618	0.0278
9/2	9/2	4	2	2	- 0.6333	1.0118	0.6266	0.1131	0.7638	- 0.3367
9/2	9/2	4	2	4	0.0000	0.0000	0.5266	0.6470	- 0.4965	- 0.0675
9/2	9/2	4	4	0	1.7879	0.0000	0.0000	0.0455	0.0000	- 1.2133
9/2	9/2	4	4	2	0.8219	0.0000	0.4131	- 0.6734	0.0000	- 0.8352
9/2	9/2	4	4	4	0.0000	0.0000	- 0.4174	- 0.8086	0.0000	0.1537

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 5$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
2	5	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.2988
2	5	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.5736
2	5	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.4702
2	5	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0382
2	5	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2216
2	5	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0706
2	5	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0040
2	5	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.1051
2	5	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0061
2	5	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	0.6814
2	5	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.1941
2	5	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0125
3	5	2	0	2	0.0000	0.0000	0.0000	- 0.2062	- 0.5455	0.3608
3	5	2	2	0	0.0000	0.0000	0.0000	1.9003	0.0000	0.9501
3	5	2	2	2	0.0000	0.0000	0.0000	0.3245	0.6438	- 0.2839
3	5	2	2	4	0.0000	0.0000	0.0000	- 0.0967	0.4799	- 0.1308
3	5	2	4	2	0.0000	0.0000	0.0000	- 0.8430	- 0.3717	- 0.9835
3	5	2	4	4	0.0000	0.0000	0.0000	0.1786	- 0.6793	0.1421
3	5	4	0	4	0.0000	0.0000	0.0000	- 0.0203	0.1343	- 0.0549
3	5	4	2	2	0.0000	0.0000	0.0000	- 0.1438	- 0.5072	0.7129
3	5	4	2	4	0.0000	0.0000	0.0000	0.0305	- 0.1864	0.0751
3	5	4	4	0	0.0000	0.0000	0.0000	1.6307	0.0000	- 1.0871
3	5	4	4	2	0.0000	0.0000	0.0000	0.2655	0.5268	- 0.7743
3	5	4	4	4	0.0000	0.0000	0.0000	- 0.0625	0.3099	- 0.1193
4	5	2	0	2	0.1595	- 0.7568	0.6973	0.2849	- 0.0919	0.4530
4	5	2	2	0	2.1005	0.0000	0.0000	1.5754	0.0000	0.8742
4	5	2	2	2	- 0.2511	0.9924	- 0.4291	- 0.2690	0.3753	- 0.5861
4	5	2	2	4	0.0000	0.0000	0.3775	0.4545	- 0.8808	0.0297
4	5	2	4	2	0.6523	- 1.3751	0.2619	- 0.3883	- 0.6886	- 0.7090
4	5	2	4	4	0.0000	0.0000	- 0.4174	- 0.6088	0.6843	0.0726
4	5	4	0	4	0.0000	0.0000	0.1709	0.1937	- 0.6006	0.0979
4	5	4	2	2	0.1477	- 0.8563	1.0249	0.5275	0.4777	0.2063
4	5	4	2	4	0.0000	0.0000	- 0.2096	- 0.2683	0.7383	- 0.1076
4	5	4	4	0	2.3932	0.0000	0.0000	0.3989	0.0000	- 1.1133
4	5	4	4	2	- 0.2727	1.0780	0.3362	- 0.5195	0.2316	- 0.8399
4	5	4	4	4	0.0000	0.0000	0.2450	0.4432	- 0.8589	0.0720
5	5	2	0	2	- 0.4416	0.2739	0.6928	0.2831	0.2864	0.3284
5	5	2	2	0	2.0125	0.0000	0.0000	1.5882	0.0000	1.0091
5	5	2	2	2	0.5612	0.0000	- 0.5661	- 0.4352	0.0000	- 0.6675
5	5	2	2	4	0.0000	0.0000	- 0.6407	- 0.7069	- 0.0000	0.1168
5	5	2	4	2	- 0.6481	- 0.9378	0.7142	0.1780	- 0.7620	- 0.2006
5	5	2	4	4	0.0000	0.0000	0.5410	0.6488	0.4488	- 0.0754
5	5	4	0	4	0.0000	0.0000	- 0.5000	- 0.5230	0.5168	0.0386
5	5	4	2	2	- 0.6481	0.9378	0.7142	0.1780	0.7620	- 0.2006
5	5	4	2	4	0.0000	0.0000	0.5410	0.6488	- 0.4488	- 0.0754
5	5	4	4	0	2.0000	0.0000	0.0000	0.4615	0.0000	- 0.8846
5	5	4	4	2	0.7977	0.0000	0.2011	- 0.6575	0.0000	- 0.8963
5	5	4	4	4	0.0000	0.0000	- 0.4646	- 0.7840	- 0.0000	0.1446

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 11/2$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
5/2	11/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.3341
5/2	11/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.7189
5/2	11/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.5136
5/2	11/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0418
5/2	11/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2581
5/2	11/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0727
5/2	11/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0070
5/2	11/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.1779
5/2	11/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0103
5/2	11/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.0871
5/2	11/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.3097
5/2	11/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0199
7/2	11/2	2	0	2	0.0000	0.0000	0.0000	- 0.2182	- 0.5563	0.3273
7/2	11/2	2	2	0	0.0000	0.0000	0.0000	1.9648	0.0000	1.1875
7/2	11/2	2	2	2	0.0000	0.0000	0.0000	0.3355	0.6580	- 0.2323
7/2	11/2	2	2	4	0.0000	0.0000	0.0000	- 0.1000	0.4904	- 0.1303
7/2	11/2	2	4	2	0.0000	0.0000	0.0000	- 0.8218	- 0.4835	- 0.9798
7/2	11/2	2	4	4	0.0000	0.0000	0.0000	0.1741	- 0.6744	0.1373
7/2	11/2	4	0	4	0.0000	0.0000	0.0000	- 0.0253	0.1614	- 0.0627
7/2	11/2	4	2	2	0.0000	0.0000	0.0000	- 0.1752	- 0.5841	0.7345
7/2	11/2	4	2	4	0.0000	0.0000	0.0000	0.0371	- 0.2202	0.0838
7/2	11/2	4	4	0	0.0000	0.0000	0.0000	1.8734	0.0000	- 0.5970
7/2	11/2	4	4	2	0.0000	0.0000	0.0000	0.3050	0.5981	- 0.7038
7/2	11/2	4	4	4	0.0000	0.0000	0.0000	- 0.0718	0.3519	- 0.1251
9/2	11/2	2	0	2	0.1651	- 0.7687	0.6876	0.2752	- 0.1231	0.4541
9/2	11/2	2	2	0	2.1242	0.0000	0.0000	1.6885	0.0000	1.0932
9/2	11/2	2	2	2	- 0.2539	1.0000	- 0.4763	- 0.2558	0.3889	- 0.5587
9/2	11/2	2	2	4	0.0000	0.0000	0.3799	0.4547	- 0.8738	0.0274
9/2	11/2	2	4	2	0.6219	- 1.4103	0.3367	- 0.3303	- 0.7564	- 0.6248
9/2	11/2	2	4	4	0.0000	0.0000	- 0.4239	- 0.5889	0.6995	0.0628
9/2	11/2	4	0	4	0.0000	0.0000	0.1846	0.2102	- 0.6244	0.0935
9/2	11/2	4	2	2	0.1636	- 0.9179	1.0494	0.5285	0.3858	0.3356
9/2	11/2	4	2	4	0.0000	0.0000	- 0.2260	- 0.2853	0.7576	- 0.0998
9/2	11/2	4	4	0	2.4996	0.0000	0.0000	0.7905	0.0000	- 0.7432
9/2	11/2	4	4	2	- 0.2849	1.1219	0.1499	- 0.4817	0.2866	- 0.8642
9/2	11/2	4	4	4	0.0000	0.0000	0.2693	0.4486	- 0.8619	0.0601
11/2	11/2	2	0	2	- 0.4425	0.2509	0.6968	0.2890	0.2634	0.3477
11/2	11/2	2	2	0	2.0484	0.0000	0.0000	1.6892	0.0000	1.1906
11/2	11/2	2	2	2	0.5570	- 0.0000	- 0.6121	- 0.4271	- 0.0000	- 0.6499
11/2	11/2	2	2	4	0.0000	0.0000	- 0.6405	- 0.7029	- 0.0000	0.1154
11/2	11/2	2	4	2	- 0.6592	- 0.8721	0.7818	0.2287	- 0.7460	- 0.0837
11/2	11/2	2	4	4	0.0000	0.0000	0.5519	0.6499	0.4095	- 0.0810
11/2	11/2	4	0	4	0.0000	0.0000	- 0.5057	- 0.5309	0.4779	0.0469
11/2	11/2	4	2	2	- 0.6592	0.8721	0.7818	0.2287	0.7460	- 0.0837
11/2	11/2	4	2	4	0.0000	0.0000	0.5519	0.6499	- 0.4095	- 0.0810
11/2	11/2	4	4	0	2.1608	0.0000	0.0000	0.8062	0.0000	- 0.5285
11/2	11/2	4	4	2	0.7794	- 0.0000	0.0251	- 0.6406	- 0.0000	- 0.9206
11/2	11/2	4	4	4	0.0000	0.0000	- 0.4982	- 0.7663	- 0.0000	0.1380

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 6$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
3	6	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.3608
3	6	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.8205
3	6	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.5440
3	6	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0442
3	6	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2688
3	6	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0733
3	6	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0097
3	6	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.2411
3	6	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0139
3	6	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.4025
3	6	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.3996
3	6	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0256
4	6	2	0	2	0.0000	0.0000	0.0000	- 0.2279	- 0.5641	0.2991
4	6	2	2	0	0.0000	0.0000	0.0000	2.0124	0.0000	1.3655
4	6	2	2	2	0.0000	0.0000	0.0000	0.3436	0.6682	- 0.1933
4	6	2	2	4	0.0000	0.0000	0.0000	- 0.1024	0.4980	- 0.1298
4	6	2	4	2	0.0000	0.0000	0.0000	- 0.8014	- 0.5667	- 0.9517
4	6	2	4	4	0.0000	0.0000	0.0000	0.1698	- 0.6679	0.1341
4	6	4	0	4	0.0000	0.0000	0.0000	- 0.0298	0.1844	- 0.0687
4	6	4	2	2	0.0000	0.0000	0.0000	- 0.2022	- 0.6433	0.7328
4	6	4	2	4	0.0000	0.0000	0.0000	0.0428	- 0.2480	0.0900
4	6	4	4	0	0.0000	0.0000	0.0000	2.0583	0.0000	- 0.1470
4	6	4	4	2	0.0000	0.0000	0.0000	0.3351	0.6516	- 0.6283
4	6	4	4	4	0.0000	0.0000	0.0000	- 0.0789	0.3834	- 0.1281
5	6	2	0	2	0.1698	- 0.7783	0.6794	0.2669	- 0.1482	0.4529
5	6	2	2	0	2.1422	0.0000	0.0000	1.7750	0.0000	1.2649
5	6	2	2	2	- 0.2560	1.0057	- 0.5121	- 0.2456	0.3991	- 0.5365
5	6	2	2	4	0.0000	0.0000	0.3817	0.4549	- 0.8686	0.0258
5	6	2	4	2	0.5972	- 1.4335	0.3981	- 0.2803	- 0.8005	- 0.5403
5	6	2	4	4	0.0000	0.0000	- 0.4271	- 0.5733	0.7115	0.0551
5	6	4	0	4	0.0000	0.0000	0.1961	0.2241	- 0.6419	0.0891
5	6	4	2	2	0.1774	- 0.9678	1.9644	0.5249	0.3042	0.4308
5	6	4	2	4	0.0000	0.0000	- 0.2396	- 0.2992	0.7711	- 0.0930
5	6	4	4	0	2.5802	0.0000	0.0000	1.1058	0.0000	- 0.3686
5	6	4	4	2	- 0.2940	1.1550	0.0000	- 0.4501	0.3300	- 0.8611
5	6	4	4	4	0.0000	0.0000	0.2883	0.4519	- 0.8629	0.0517
6	6	2	0	2	- 0.4432	0.2315	0.6999	0.2935	0.2437	0.3626
6	6	2	2	0	2.0763	0.0000	0.0000	1.7685	0.0000	1.3358
6	6	2	2	2	0.5536	0.0000	- 0.6481	- 0.4207	0.0000	- 0.6352
6	6	2	2	4	0.0000	0.0000	- 0.6404	- 0.6998	- 0.0000	0.1143
6	6	2	4	2	- 0.6679	- 0.8138	0.8349	0.2689	- 0.7229	0.0152
6	6	2	4	4	0.0000	0.0000	0.5604	0.6506	0.3765	- 0.0851
6	6	4	0	4	0.0000	0.0000	- 0.5101	- 0.5370	0.4440	0.0534
6	6	4	2	2	- 0.6679	0.8138	0.8349	0.2689	0.7229	0.0152
6	6	4	2	4	0.0000	0.0000	0.5604	0.6506	- 0.3765	- 0.0851
6	6	4	4	0	2.2857	0.0000	0.0000	1.0909	0.0000	- 0.1851
6	6	4	4	2	0.7652	0.0000	- 0.1205	- 0.6248	0.0000	- 0.9252
6	6	4	4	4	0.0000	0.0000	- 0.5231	- 0.7533	- 0.0000	0.1330

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 13/2$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
7/2	13/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.3819
7/2	13/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.8947
7/2	13/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.5661
7/2	13/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0460
7/2	13/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2668
7/2	13/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0732
7/2	13/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0121
7/2	13/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.2957
7/2	13/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0171
7/2	13/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.6503
7/2	13/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.4702
7/2	13/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0302
9/2	13/2	2	0	2	0.0000	0.0000	0.0000	- 0.2359	- 0.5698	0.2752
9/2	13/2	2	2	0	0.0000	0.0000	0.0000	2.0484	0.0000	1.5021
9/2	13/2	2	2	2	0.0000	0.0000	0.0000	0.3498	0.6758	- 0.1632
9/2	13/2	2	2	4	0.0000	0.0000	0.0000	- 0.1043	0.5037	- 0.1294
9/2	13/2	2	4	2	0.0000	0.0000	0.0000	- 0.7826	- 0.6301	- 0.9131
9/2	13/2	2	4	4	0.0000	0.0000	0.0000	0.1658	- 0.6608	0.1319
9/2	13/2	4	0	4	0.0000	0.0000	0.0000	- 0.0338	0.2040	- 0.0735
9/2	13/2	4	2	2	0.0000	0.0000	0.0000	- 0.2254	- 0.6896	0.7188
9/2	13/2	4	2	4	0.0000	0.0000	0.0000	0.0478	- 0.2711	0.0947
9/2	13/2	4	4	0	0.0000	0.0000	0.0000	2.2019	0.0000	0.2447
9/2	13/2	4	4	2	0.0000	0.0000	0.0000	0.3585	0.6926	- 0.5576
9/2	13/2	4	4	4	0.0000	0.0000	0.0000	- 0.0844	0.4075	- 0.1297
11/2	13/2	2	0	2	0.1738	- 0.7862	0.6724	0.2596	- 0.1689	0.4504
11/2	13/2	2	2	0	2.1562	0.0000	0.0000	1.8426	0.0000	1.4015
11/2	13/2	2	2	2	- 0.2577	1.0102	- 0.5399	- 0.2376	0.4070	- 0.5184
11/2	13/2	2	2	4	0.0000	0.0000	0.3831	0.4550	- 0.8646	0.0245
11/2	13/2	2	4	2	0.5767	- 1.4490	0.4492	- 0.2372	- 0.8290	- 0.4609
11/2	13/2	2	4	4	0.0000	0.0000	- 0.4283	- 0.5607	0.7212	0.0488
11/2	13/2	4	0	4	0.0000	0.0000	0.2059	0.2359	- 0.6552	0.0850
11/2	13/2	4	2	2	0.1894	- 1.0088	1.0733	0.5190	0.2324	0.5014
11/2	13/2	4	2	4	0.0000	0.0000	- 0.2510	- 0.3106	0.7808	- 0.0871
11/2	13/2	4	4	0	2.6427	0.0000	0.0000	1.3614	0.0000	- 0.0200
11/2	13/2	4	4	2	- 0.3012	1.1805	- 0.1213	- 0.4237	0.3646	- 0.8453
11/2	13/2	4	4	4	0.0000	0.0000	0.3034	0.4541	- 0.3628	0.0455
13/2	13/2	2	0	2	- 0.4438	0.2148	0.7023	0.2972	0.2267	0.3744
13/2	13/2	2	2	0	2.0985	0.0000	0.0000	1.8319	0.0000	1.4534
13/2	13/2	2	2	2	0.5510	- 0.0000	- 0.6767	- 0.4156	- 0.0000	- 0.6229
13/2	13/2	2	2	4	0.0000	0.0000	- 0.6402	- 0.6974	- 0.0000	0.1135
13/2	13/2	2	4	2	- 0.6747	- 0.7622	0.8774	0.3012	- 0.6966	0.0985
13/2	13/2	2	4	4	0.0000	0.0000	0.5671	0.6510	0.3485	- 0.0881
13/2	13/2	4	0	4	0.0000	0.0000	- 0.5136	- 0.5418	0.4144	0.0585
13/2	13/2	4	2	2	- 0.6747	0.7622	0.8774	0.3012	0.6966	0.0935
13/2	13/2	4	2	4	0.0000	0.0000	0.5671	0.6510	- 0.3485	- 0.0881
13/2	13/2	4	4	0	2.3846	0.0000	0.0000	1.3269	0.0000	0.1299
13/2	13/2	4	4	2	0.7539	- 0.0000	- 0.2413	- 0.6105	- 0.0000	- 0.9196
13/2	13/2	4	4	4	0.0000	0.0000	- 0.5420	- 0.7434	- 0.0000	0.1292

$$F_{\lambda}^{\lambda_2 \lambda_1}(L, L', l_2, l_1) \text{ for } l_1 = 7$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
4	7	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.3989
4	7	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.9504
4	7	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.5828
4	7	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0474
4	7	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	-1.2586
4	7	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0727
4	7	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0142
4	7	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.3429
4	7	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0198
4	7	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.8471
4	7	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.5262
4	7	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0338
5	7	2	0	2	0.0000	0.0000	0.0000	-0.2426	-0.5742	0.2548
5	7	2	2	0	0.0000	0.0000	0.0000	2.0763	0.0000	1.6091
5	7	2	2	2	0.0000	0.0000	0.0000	0.3545	0.6817	-0.1396
5	7	2	2	4	0.0000	0.0000	0.0000	-0.1057	0.5081	-0.1291
5	7	2	4	2	0.0000	0.0000	0.0000	-0.7656	-0.6794	-0.8709
5	7	2	4	4	0.0000	0.0000	0.0000	0.1622	-0.6538	0.1303
5	7	4	0	4	0.0000	0.0000	0.0000	-0.0374	0.2210	-0.0773
5	7	4	2	2	0.0000	0.0000	0.0000	-0.2456	-0.7266	0.6985
5	7	4	2	4	0.0000	0.0000	0.0000	0.0520	-0.2906	0.0983
5	7	4	4	0	0.0000	0.0000	0.0000	2.3155	0.0000	0.5789
5	7	4	4	2	0.0000	0.0000	0.0000	0.3770	0.7248	-0.4948
5	7	4	4	4	0.0000	0.0000	0.0000	-0.0887	0.4264	-0.1306
6	7	2	0	2	0.1773	-0.7923	0.6664	0.2533	-0.1863	0.4472
6	7	2	2	0	2.1673	0.0000	0.0000	1.8964	0.0000	1.5117
6	7	2	2	2	-0.2590	1.0136	-0.5620	-0.2313	0.4132	-0.5035
6	7	2	2	4	0.0000	0.0000	0.3842	0.4551	-0.8614	0.0236
6	7	2	4	2	0.5594	-1.4593	0.4922	-0.1998	-0.8470	-0.3883
6	7	2	4	4	0.0000	0.0000	-0.4284	-0.5503	0.7291	0.0436
6	7	4	0	4	0.0000	0.0000	0.2143	0.2461	-0.6655	0.0812
6	7	4	2	2	0.1999	-1.0430	1.0784	0.5117	0.1694	0.5542
6	7	4	2	4	0.0000	0.0000	-0.2607	-0.3202	0.7879	-0.0820
6	7	4	4	0	2.6922	0.0000	0.0000	1.5705	0.0000	0.2927
6	7	4	4	2	-0.3068	1.2006	-0.2205	-0.4018	0.3927	-0.8242
6	7	4	4	4	0.0000	0.0000	0.3156	0.4556	-0.8623	0.0409
7	7	2	0	2	-0.4442	0.2004	0.7042	0.3001	0.2118	0.3839
7	7	2	2	0	2.1163	0.0000	0.0000	1.8832	0.0000	1.5499
7	7	2	2	2	0.5488	0.0000	-0.6999	-0.4114	0.0000	-0.6127
7	7	2	2	4	0.0000	0.0000	-0.6401	-0.6955	-0.0000	0.1128
7	7	2	4	2	-0.6802	-0.7162	0.9120	0.3276	-0.6693	0.1689
7	7	2	4	4	0.0000	0.0000	0.5725	0.6512	0.3244	-0.0905
7	7	4	0	4	0.0000	0.0000	-0.5163	-0.5457	0.3883	0.0627
7	7	4	2	2	-0.6802	0.7162	0.9120	0.3276	0.6693	0.1689
7	7	4	2	4	0.0000	0.0000	0.5725	0.6512	-0.3244	-0.0905
7	7	4	4	0	2.4643	0.0000	0.0000	1.5238	0.0000	0.4119
7	7	4	4	2	0.7448	0.0000	-0.3420	-0.5979	0.0000	-0.9089
7	7	4	4	4	0.0000	0.0000	-0.5567	-0.7357	-0.0000	0.1262

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' l_2 l_1) \text{ for } l_1 = 15/2$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
9/2	15/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4129
9/2	15/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	1.9935
9/2	15/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.5957
9/2	15/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0484
9/2	15/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2473
9/2	15/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0721
9/2	15/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0161
9/2	15/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.3839
9/2	15/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0222
9/2	15/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.0053
9/2	15/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.5713
9/2	15/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0367
11/2	15/2	2	0	2	0.0000	0.0000	0.0000	- 0.2483	- 0.5776	0.2371
11/2	15/2	2	2	0	0.0000	0.0000	0.0000	2.0984	0.0000	1.6945
11/2	15/2	2	2	2	0.0000	0.0000	0.0000	0.3583	0.6863	- 0.1207
11/2	15/2	2	2	4	0.0000	0.0000	0.0000	- 0.1068	0.5115	- 0.1288
11/2	15/2	2	4	2	0.0000	0.0000	0.0000	- 0.7503	- 0.7185	- 0.8285
11/2	15/2	2	4	4	0.0000	0.0000	0.0000	0.1530	- 0.6470	0.1292
11/2	15/2	4	0	4	0.0000	0.0000	0.0000	- 0.0406	0.2358	- 0.0804
11/2	15/2	4	2	2	0.0000	0.0000	0.0000	- 0.2633	- 0.7564	0.6751
11/2	15/2	4	2	4	0.0000	0.0000	0.0000	0.0558	- 0.3072	0.1011
11/2	15/2	4	4	0	0.0000	0.0000	0.0000	2.4067	0.0000	0.3623
11/2	15/2	4	4	2	0.0000	0.0000	0.0000	0.3918	0.7504	- 0.4400
11/2	15/2	4	4	4	0.0000	0.0000	0.0000	- 0.0922	0.4415	- 0.1309
13/2	15/2	2	0	2	0.1803	- 0.7984	0.6612	0.2476	- 0.2010	0.4438
13/2	15/2	2	2	0	2.1762	0.0000	0.0000	1.9398	0.0000	1.6018
13/2	15/2	2	2	2	- 0.2601	1.0164	- 0.5798	- 0.2261	0.4183	- 0.4912
13/2	15/2	2	2	4	0.0000	0.0000	0.3851	0.4552	- 0.8588	0.0228
13/2	15/2	2	4	2	0.5446	- 1.4662	0.5287	- 0.1672	- 0.8580	- 0.3228
13/2	15/2	2	4	4	0.0000	0.0000	- 0.4279	- 0.5416	0.7357	0.0392
13/2	15/2	4	0	4	0.0000	0.0000	0.2216	0.2550	- 0.6735	0.0777
13/2	15/2	4	2	2	0.2092	- 1.0720	1.0808	0.5038	0.1140	0.5939
13/2	15/2	4	2	4	0.0000	0.0000	- 0.2690	- 0.3284	0.7932	- 0.0775
13/2	15/2	4	4	0	2.7321	0.0000	0.0000	1.7431	0.0000	0.5687
13/2	15/2	4	4	2	- 0.3113	1.2167	- 0.3023	- 0.3834	0.4156	- 0.8016
13/2	15/2	4	4	4	0.0000	0.0000	0.3255	0.4566	- 0.8615	0.0374
15/2	15/2	2	0	2	- 0.4446	0.1879	0.7058	0.3024	0.1988	0.3916
15/2	15/2	2	2	0	2.1308	0.0000	0.0000	1.9254	0.0000	1.6298
15/2	15/2	2	2	2	0.5471	0.0000	- 0.7188	- 0.4079	0.0000	- 0.6040
15/2	15/2	2	2	4	0.0000	0.0000	- 0.6399	- 0.6940	- 0.0000	0.1123
15/2	15/2	2	4	2	- 0.6847	- 0.6751	0.9404	0.3493	- 0.6422	0.2286
15/2	15/2	2	4	4	0.0000	0.0000	0.5770	0.6514	0.3034	- 0.0923
15/2	15/2	4	0	4	0.0000	0.0000	- 0.5186	- 0.5488	0.3652	0.0661
15/2	15/2	4	2	2	- 0.6847	0.6751	0.9404	0.3493	0.6422	0.2286
15/2	15/2	4	2	4	0.0000	0.0000	0.5770	0.6514	- 0.3034	- 0.0923
15/2	15/2	4	4	0	2.5294	0.0000	0.0000	1.6891	0.0000	0.6616
15/2	15/2	4	4	2	0.7374	- 0.0000	- 0.4266	- 0.5869	0.0000	- 0.8960
15/2	15/2	4	4	4	0.0000	0.0000	- 0.5685	- 0.7296	- 0.0000	0.1239

$$c_{\lambda} \lambda_2 \lambda_1 (L L' l_2 l_1) \text{ for } l_1 = 8$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
5	8	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4246
5	8	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.0275
5	8	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6058
5	8	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0493
5	8	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2347
5	8	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0713
5	8	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0178
5	8	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4197
5	8	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0243
5	8	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1338
5	8	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6079
5	8	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0390
6	8	2	0	2	0.0000	0.0000	0.0000	- 0.2533	- 0.5803	0.2216
6	8	2	2	0	0.0000	0.0000	0.0000	2.1163	0.0000	1.7636
6	8	2	2	2	0.0000	0.0000	0.0000	0.3613	0.6900	- 0.1054
6	8	2	2	4	0.0000	0.0000	0.0000	- 0.1077	0.5143	- 0.1285
6	8	2	4	2	0.0000	0.0000	0.0000	- 0.7365	- 0.7500	- 0.7876
6	8	2	4	4	0.0000	0.0000	0.0000	0.1560	- 0.6406	0.1283
6	8	4	0	4	0.0000	0.0000	0.0000	- 0.0434	0.2488	- 0.0829
6	8	4	2	2	0.0000	0.0000	0.0000	- 0.2789	- 0.7810	0.6507
6	8	4	2	4	0.0000	0.0000	0.0000	0.0591	- 0.3215	0.1034
6	8	4	4	0	0.0000	0.0000	0.0000	2.4810	0.0000	1.1027
6	8	4	4	2	0.0000	0.0000	0.0000	0.4039	0.7712	- 0.3927
6	8	4	4	4	0.0000	0.0000	0.0000	- 0.0951	0.4538	- 0.1311
7	8	2	0	2	0.1829	- 0.8033	0.6566	0.2426	- 0.2136	0.4402
7	8	2	2	0	2.1835	0.0000	0.0000	1.9755	0.0000	1.6762
7	8	2	2	2	- 0.2610	1.0187	- 0.5944	- 0.2219	0.4224	- 0.4809
7	8	2	2	4	0.0000	0.0000	0.3859	0.4552	- 0.8568	0.0222
7	8	2	4	2	0.5319	- 1.4707	0.5601	- 0.1387	- 0.8640	- 0.2641
7	8	2	4	4	0.0000	0.0000	- 0.4269	- 0.5341	0.7414	0.0354
7	8	4	0	4	0.0000	0.0000	0.2280	0.2627	- 0.6800	0.0745
7	8	4	2	2	0.2175	- 1.0968	1.0814	0.4957	0.0652	0.6239
7	8	4	2	4	0.0000	0.0000	- 0.2762	- 0.3355	0.7972	- 0.0736
7	8	4	4	0	2.7647	0.0000	0.0000	1.8870	0.0000	0.8103
7	8	4	4	2	- 0.3151	1.2299	- 0.3704	- 0.3679	0.4346	- 0.7793
7	8	4	4	4	0.0000	0.0000	0.3337	0.4573	- 0.8608	0.0346
8	8	2	0	2	- 0.4449	0.1768	0.7071	0.3044	0.1873	0.3980
8	8	2	2	0	2.1429	0.0000	0.0000	1.9605	0.0000	1.6967
8	8	2	2	2	0.5457	0.0000	- 0.7345	- 0.4050	0.0000	- 0.5966
8	8	2	2	4	0.0000	0.0000	- 0.6398	- 0.6927	- 0.0000	0.1118
8	8	2	4	2	- 0.6884	- 0.6383	0.9640	0.3675	- 0.6160	0.2795
8	8	2	4	4	0.0000	0.0000	0.5807	0.6515	0.2850	- 0.0938
8	8	4	0	4	0.0000	0.0000	- 0.5204	- 0.5514	0.3447	0.0689
8	8	4	2	2	- 0.6884	0.6383	0.9640	0.3675	0.6160	0.2795
8	8	4	2	4	0.0000	0.0000	0.5807	0.6515	- 0.2850	- 0.0938
8	8	4	4	0	2.5833	0.0000	0.0000	1.8289	0.0000	0.8816
8	8	4	4	2	0.7312	0.0000	- 0.4981	- 0.5773	0.0000	- 0.8824
8	8	4	4	4	0.0000	0.0000	- 0.5780	- 0.7246	- 0.0000	0.1220

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 17/2$$

					L, L'					
I_2	I_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
11/2	17/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4346
11/2	17/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.0547
11/2	17/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6140
11/2	17/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0499
11/2	17/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2218
11/2	17/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0706
11/2	17/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0194
11/2	17/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4512
11/2	17/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0261
11/2	17/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.2396
11/2	17/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6381
11/2	17/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0410
13/2	17/2	2	0	2	0.0000	0.0000	0.0000	- 0.2575	- 0.5825	0.2080
13/2	17/2	2	2	0	0.0000	0.0000	0.0000	2.1308	0.0000	1.8203
13/2	17/2	2	2	2	0.0000	0.0000	0.0000	0.3638	0.6930	- 0.0928
13/2	17/2	2	2	4	0.0000	0.0000	0.0000	- 0.1085	0.5165	- 0.1283
13/2	17/2	2	4	2	0.0000	0.0000	0.0000	- 0.7240	- 0.7757	- 0.7489
13/2	17/2	2	4	4	0.0000	0.0000	0.0000	0.1534	- 0.6346	0.1276
13/2	17/2	4	0	4	0.0000	0.0000	0.0000	- 0.0460	0.2603	- 0.0851
13/2	17/2	4	2	2	0.0000	0.0000	0.0000	- 0.2927	- 0.8013	0.6262
13/2	17/2	4	2	4	0.0000	0.0000	0.0000	0.0620	- 0.3340	0.1052
13/2	17/2	4	4	0	0.0000	0.0000	0.0000	2.5423	0.0000	1.3072
13/2	17/2	4	4	2	0.0000	0.0000	0.0000	0.4139	0.7883	- 0.3519
13/2	17/2	4	4	4	0.0000	0.0000	0.0000	- 0.0974	0.4638	- 0.1311
15/2	17/2	2	0	2	0.1852	- 0.8074	0.6525	0.2382	- 0.2245	0.4366
15/2	17/2	2	2	0	2.1895	0.0000	0.0000	2.0051	0.0000	1.7384
15/2	17/2	2	2	2	- 0.2617	1.0206	- 0.6065	- 0.2184	0.4257	- 0.4722
15/2	17/2	2	2	4	0.0000	0.0000	0.3865	0.4552	- 0.8550	0.0217
15/2	17/2	2	4	2	0.5208	- 1.4735	0.5873	- 0.1135	- 0.8666	- 0.2114
15/2	17/2	2	4	4	0.0000	0.0000	- 0.4258	- 0.5276	0.7462	0.0321
15/2	17/2	4	0	4	0.0000	0.0000	0.2337	0.2696	- 0.6851	0.0716
15/2	17/2	4	2	2	0.2250	- 1.1182	1.0809	0.4877	0.0219	0.6467
15/2	17/2	4	2	4	0.0000	0.0000	- 0.2825	- 0.3417	0.8002	- 0.0701
15/2	17/2	4	4	0	2.7916	0.0000	0.0000	2.0080	0.0000	1.0215
15/2	17/2	4	4	2	- 0.3181	1.2408	- 0.4276	- 0.3548	0.4505	- 0.7583
15/2	17/2	4	4	4	0.0000	0.0000	0.3405	0.4579	- 0.8600	0.0324
17/2	17/2	2	0	2	- 0.4451	0.1669	0.7082	0.3060	0.1771	0.4034
17/2	17/2	2	2	0	2.1530	0.0000	0.0000	1.9900	0.0000	1.7532
17/2	17/2	2	2	2	0.5445	- 0.0000	- 0.7477	- 0.4025	- 0.0000	- 0.5904
17/2	17/2	2	2	4	0.0000	0.0000	- 0.6398	- 0.6916	- 0.0000	0.1115
17/2	17/2	2	4	2	- 0.6916	- 0.6051	0.9838	0.3828	- 0.5909	0.3231
17/2	17/2	2	4	4	0.0000	0.0000	0.5837	0.6515	0.2687	- 0.0950
17/2	17/2	4	0	4	0.0000	0.0000	- 0.5220	- 0.5536	0.3262	0.0713
17/2	17/2	4	2	2	- 0.6916	0.6051	0.9838	0.3828	0.5909	0.3231
17/2	17/2	4	2	4	0.0000	0.0000	0.5837	0.6515	- 0.2687	- 0.0950
17/2	17/2	4	4	0	2.6285	0.0000	0.0000	1.9481	0.0000	1.0751
17/2	17/2	4	4	2	0.7261	- 0.0000	- 0.5591	- 0.5689	- 0.0000	- 0.8690
17/2	17/2	4	4	4	0.0000	0.0000	- 0.5858	- 0.7205	- 0.0000	0.1205

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 9$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
6	9	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4432
6	9	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.0770
6	9	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6206
6	9	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0505
6	9	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.2090
6	9	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0699
6	9	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0207
6	9	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4790
6	9	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0277
6	9	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.3274
6	9	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6631
6	9	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0426
7	9	2	0	2	0.0000	0.0000	0.0000	- 0.2613	- 0.5843	0.1960
7	9	2	2	0	0.0000	0.0000	0.0000	2.1429	0.0000	1.8674
7	9	2	2	2	0.0000	0.0000	0.0000	0.3659	0.6954	- 0.0823
7	9	2	2	4	0.0000	0.0000	0.0000	- 0.1091	0.5183	- 0.1282
7	9	2	4	2	0.0000	0.0000	0.0000	- 0.7128	- 0.7969	- 0.7128
7	9	2	4	4	0.0000	0.0000	0.0000	0.1510	- 0.6290	0.1270
7	9	4	0	4	0.0000	0.0000	0.0000	- 0.0484	0.2706	- 0.0869
7	9	4	2	2	0.0000	0.0000	0.0000	- 0.3050	- 0.8183	0.6023
7	9	4	2	4	0.0000	0.0000	0.0000	0.0646	- 0.3450	0.1068
7	9	4	4	0	0.0000	0.0000	0.0000	2.5935	0.0000	1.4820
7	9	4	4	2	0.0000	0.0000	0.0000	0.4222	0.8025	- 0.3167
7	9	4	4	4	0.0000	0.0000	0.0000	- 0.0994	0.4721	- 0.1310
8	9	2	0	2	0.1873	- 0.8111	0.6489	0.2341	- 0.2341	0.4332
8	9	2	2	0	2.1945	0.0000	0.0000	2.0299	0.0000	1.7909
8	9	2	2	2	- 0.2623	1.0222	- 0.6166	- 0.2155	0.4286	- 0.4649
8	9	2	2	4	0.0000	0.0000	0.3870	0.4552	- 0.8536	0.0213
8	9	2	4	2	0.5110	- 1.4751	0.6111	- 0.0912	- 0.8668	- 0.1642
8	9	2	4	4	0.0690	0.0000	- 0.4244	- 0.5220	0.7504	0.0293
8	9	4	0	4	0.0000	0.0000	0.2388	0.2757	- 0.6893	0.0689
8	9	4	2	2	0.2317	- 1.1368	1.0795	0.4799	- 0.0165	0.6639
8	9	4	2	4	0.0000	0.0000	- 0.2881	- 0.3471	0.8026	- 0.0671
8	9	4	4	0	2.8142	0.0000	0.0000	2.1107	0.0000	1.2061
8	9	4	4	2	- 0.3207	1.2498	- 0.4761	- 0.3436	0.4639	- 0.7388
8	9	4	4	4	0.0000	0.0000	0.3463	0.4582	- 0.8592	0.0306
9	9	2	0	2	- 0.4453	0.1581	0.7091	0.3074	0.1678	0.4079
9	9	2	2	0	2.1615	0.0000	0.0000	2.0150	0.0000	1.8014
9	9	2	2	2	0.5434	0.0000	- 0.7589	- 0.4005	0.0000	- 0.5850
9	9	2	2	4	0.0000	0.0000	- 0.6397	- 0.6907	- 0.0000	0.1112
9	9	2	4	2	- 0.6942	0.5751	1.0007	0.3958	- 0.5671	0.3608
9	9	2	4	4	0.0000	0.0000	0.5863	0.6516	0.2542	- 0.0960
9	9	4	0	4	0.0000	0.0000	- 0.5233	- 0.5555	0.3096	0.0733
9	9	4	2	2	- 0.6942	0.5751	1.0007	0.3958	0.5671	0.3608
9	9	4	2	4	0.0000	0.0000	0.5863	0.6516	- 0.2542	- 0.0960
9	9	4	4	0	2.6667	0.0000	0.0000	2.0504	0.0000	1.2454
9	9	4	4	2	0.7218	0.0000	- 0.6114	- 0.5616	0.0000	- 0.8561
9	9	4	4	4	0.0000	0.0000	- 0.5923	- 0.7171	- 0.0000	0.1193

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 19/2$$

					L, L'					
I_2	I_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
13/2	19/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4507
13/2	19/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.0953
13/2	19/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6261
13/2	19/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0509
13/2	19/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1966
13/2	19/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0691
13/2	19/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0220
13/2	19/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5036
13/2	19/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0291
13/2	19/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.4011
13/2	19/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6841
13/2	19/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0439
15/2	19/2	2	0	2	0.0000	0.0000	0.0000	- 0.2646	- 0.5858	0.1852
15/2	19/2	2	2	0	0.0000	0.0000	0.0000	2.1530	0.0000	1.9069
15/2	19/2	2	2	2	0.0000	0.0000	0.0000	0.3676	0.6975	- 0.0735
15/2	19/2	2	2	4	0.0000	0.0000	0.0000	- 0.1096	0.5199	- 0.1280
15/2	19/2	2	4	2	0.0000	0.0000	0.0000	- 0.7026	- 0.8147	- 0.6792
15/2	19/2	2	4	4	0.0000	0.0000	0.0000	0.1489	- 0.6238	0.1265
15/2	19/2	4	0	4	0.0000	0.0000	0.0000	- 0.0506	0.2797	- 0.0885
15/2	19/2	4	2	2	0.0000	0.0000	0.0000	- 0.3160	- 0.8328	0.5794
15/2	19/2	4	2	4	0.0000	0.0000	0.0000	0.0670	- 0.3547	0.1080
15/2	19/2	4	4	0	0.0000	0.0000	0.0000	2.6365	0.0000	1.6321
15/2	19/2	4	4	2	0.0000	0.0000	0.0000	0.4292	0.8144	- 0.2862
15/2	19/2	4	4	4	0.0000	0.0000	0.0000	- 0.1010	0.4792	- 0.1309
17/2	19/2	2	0	2	0.1892	- 0.8143	0.6456	0.2305	- 0.2426	0.4298
17/2	19/2	2	2	0	2.1988	0.0000	0.0000	2.0510	0.0000	1.8356
17/2	19/2	2	2	2	- 0.2628	1.0235	- 0.6251	- 0.2130	0.4310	- 0.4586
17/2	19/2	2	2	4	0.0000	0.0000	0.3874	0.4553	- 0.8524	0.0210
17/2	19/2	2	4	2	0.5023	- 1.4758	0.6320	- 0.0714	- 0.8654	- 0.1218
17/2	19/2	2	4	4	0.0000	0.0000	- 0.4231	- 0.5170	0.7540	0.0267
17/2	19/2	4	0	4	0.0000	0.0000	0.2433	0.2812	- 0.6928	0.0665
17/2	19/2	4	2	2	0.2377	- 1.1532	1.0776	0.4723	- 0.0509	0.6770
17/2	19/2	4	2	4	0.0000	0.0000	- 0.2930	- 0.3519	0.8045	- 0.0643
17/2	19/2	4	4	0	2.8333	0.0000	0.0000	2.1984	0.0000	1.3678
17/2	19/2	4	4	2	- 0.3229	1.2575	- 0.5176	- 0.3340	0.4753	- 0.7210
17/2	19/2	4	4	4	0.0000	0.0000	0.3512	0.4585	- 0.8585	0.0292
19/2	19/2	2	0	2	- 0.4455	0.1502	0.7099	0.3086	0.1595	0.4118
19/2	19/2	2	2	0	2.1688	0.0000	0.0000	2.0364	0.0000	1.8428
19/2	19/2	2	2	2	0.5426	- 0.0000	- 0.7685	- 0.3987	- 0.0000	- 0.5803
19/2	19/2	2	2	4	0.0000	0.0000	- 0.6396	- 0.6899	- 0.0000	0.1109
19/2	19/2	2	4	2	- 0.6964	- 0.5478	1.0151	0.4070	- 0.5447	0.3934
19/2	19/2	2	4	4	0.0000	0.0000	0.5886	0.6516	0.2412	- 0.0968
19/2	19/2	4	0	4	0.0000	0.0000	- 0.5244	- 0.5570	0.2946	0.0750
19/2	19/2	4	2	2	- 0.6964	0.5478	1.0151	0.4070	0.5447	0.3934
19/2	19/2	4	2	4	0.0000	0.0000	0.5886	0.6516	- 0.2412	- 0.0968
19/2	19/2	4	4	0	2.6992	0.0000	0.0000	2.1388	0.0000	1.3957
19/2	19/2	4	4	2	0.7180	- 0.0000	- 0.6566	- 0.5552	- 0.0000	- 0.8441
19/2	19/2	4	4	4	0.0000	0.0000	- 0.5978	- 0.7143	- 0.0000	0.1182

$$F_{\lambda}^{\lambda_2 \lambda_1}(L, L', I_2, I_1) \text{ for } I_1 = 10$$

L, L'

I_2	I_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
7	10	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.4573
7	10	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1107
7	10	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6307
7	10	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0573
7	10	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	-1.1848
7	10	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0685
7	10	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0231
7	10	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.5257
7	10	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0304
7	10	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.4635
7	10	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7018
7	10	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0450
8	10	2	0	2	0.0000	0.0000	0.0000	-0.2676	-0.5870	0.1756
8	10	2	2	0	0.0000	0.0000	0.0000	2.1615	0.0000	1.9405
8	10	2	2	2	0.0000	0.0000	0.0000	0.3691	0.6992	-0.0661
8	10	2	2	4	0.0000	0.0000	0.0000	-0.1100	0.5212	-0.1279
8	10	2	4	2	0.0000	0.0000	0.0000	-0.6934	-0.8297	-0.6481
8	10	2	4	4	0.0000	0.0000	0.0000	0.1469	-0.6189	0.1262
8	10	4	0	4	0.0000	0.0000	0.0000	-0.0525	0.2880	-0.0898
8	10	4	2	2	0.0000	0.0000	0.0000	-0.3260	-0.8451	0.5575
8	10	4	2	4	0.0000	0.0000	0.0000	0.0691	-0.3633	0.1091
8	10	4	4	0	0.0000	0.0000	0.0000	2.6731	0.0000	1.7618
8	10	4	4	2	0.0000	0.0000	0.0000	0.4352	0.8245	-0.2596
8	10	4	4	4	0.0000	0.0000	0.0000	-0.1024	0.4851	-0.1307
9	10	2	0	2	3.1909	-0.8172	0.6427	0.2272	-0.2502	0.4266
9	10	2	2	0	2.2024	0.0000	0.0000	2.0690	0.0000	1.8739
9	10	2	2	2	-0.2632	1.0247	-0.6324	-0.2108	0.4330	-0.4532
9	10	2	2	4	0.0000	0.0000	0.3878	0.4553	0.8513	0.0207
9	10	2	4	2	0.4945	-1.4758	0.6505	-0.0535	-0.8628	-0.0837
9	10	2	4	4	0.0000	0.0000	-0.4217	-0.5126	0.7572	0.0245
9	10	4	0	4	0.0000	0.0000	0.2474	0.2861	-0.6956	0.0642
9	10	4	2	2	0.2432	-1.1677	1.0753	0.4651	-0.0818	0.6868
9	10	4	2	4	0.0000	0.0000	-0.2974	-0.3562	0.8060	-0.0618
9	10	4	4	0	2.8496	0.0000	0.0000	2.2739	0.0000	1.5098
9	10	4	4	2	-0.3247	1.2641	-0.5532	-0.3257	0.4851	-0.7048
9	10	4	4	4	0.0000	0.0000	0.3554	0.4588	-0.8579	0.0260
10	10	2	0	2	-0.4457	0.1430	-0.7106	0.3096	0.1520	0.4151
10	10	2	2	0	2.1751	0.0000	0.0000	2.0548	0.0000	1.8785
10	10	2	2	2	0.5418	-0.0000	-0.7767	-0.3971	-0.0000	-0.5763
10	10	2	2	4	0.0000	0.0000	-0.6395	-0.6893	-0.0000	-0.1107
10	10	2	4	2	-0.6984	-0.5229	1.0275	0.4166	-0.5236	0.4218
10	10	2	4	4	0.0000	0.0000	0.5905	0.6516	0.2295	-0.0975
10	10	4	0	4	0.0000	0.0000	-0.5253	-0.5584	0.2810	0.0765
10	10	4	2	2	-0.6984	0.5229	1.0275	0.4166	0.5236	0.4218
10	10	4	2	4	0.0000	0.0000	0.5905	0.6516	-0.2295	-0.0975
10	10	4	4	0	2.7273	0.0000	0.0000	2.2155	0.0000	1.5285
10	10	4	4	2	0.7148	-0.0000	-0.6958	-0.5495	-0.0000	-0.8329
10	10	4	4	4	0.0000	0.0000	-0.6024	-0.7118	0.0000	0.1173

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 21/2$$

					L, L'					
l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
15/2	21/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.4631
15/2	21/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1236
15/2	21/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6346
15/2	21/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0516
15/2	21/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	-1.1737
15/2	21/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0678
15/2	21/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0241
15/2	21/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.5455
15/2	21/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0315
15/2	21/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.5167
15/2	21/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7170
15/2	21/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0460
17/2	21/2	2	0	2	0.0000	0.0000	0.0000	-0.2703	-0.5881	0.1669
17/2	21/2	2	2	0	0.0000	0.0000	0.0000	2.1688	0.0000	1.9691
17/2	21/2	2	2	2	0.0000	0.0000	0.0000	0.3703	0.7007	-0.0597
17/2	21/2	2	2	4	0.0000	0.0000	0.0000	-0.1104	0.5223	-0.1278
17/2	21/2	2	4	2	0.0000	0.0000	0.0000	-0.6849	-0.8425	-0.6193
17/2	21/2	2	4	4	0.0000	0.0000	0.0000	0.1451	-0.6144	0.1258
17/2	21/2	4	0	4	0.0000	0.0000	0.0000	-0.0543	0.2955	-0.0910
17/2	21/2	4	2	2	0.0000	0.0000	0.0000	-0.3350	-0.8557	0.5367
17/2	21/2	4	2	4	0.0000	0.0000	0.0000	0.0710	-0.3710	0.1101
17/2	21/2	4	4	0	0.0000	0.0000	0.0000	2.7045	0.0000	1.8745
17/2	21/2	4	4	2	0.0000	0.0000	0.0000	0.4403	0.8332	-0.2365
17/2	21/2	4	4	4	0.0000	0.0000	0.0000	-0.1036	0.4902	-0.1306
19/2	21/2	2	0	2	0.1924	-0.8198	0.6400	0.2242	-0.2569	0.4236
19/2	21/2	2	2	0	2.2056	0.0000	0.0000	2.0844	0.0000	1.9070
19/2	21/2	2	2	2	-0.2636	1.0256	-0.6387	-0.2090	0.4348	-0.4485
19/2	21/2	2	2	4	0.0000	0.0000	0.3881	0.4553	-0.8504	0.0204
19/2	21/2	2	4	2	0.4876	-1.4755	0.8671	-0.0375	-0.8594	-0.0492
19/2	21/2	2	4	4	0.0000	0.0000	-0.4203	-0.5086	0.7600	0.0224
19/2	21/2	4	0	4	0.0000	0.0000	0.2512	0.2906	-0.6980	0.0621
19/2	21/2	4	2	2	0.2483	-1.1806	1.0728	0.4582	-0.1096	0.6941
19/2	21/2	4	2	4	0.0000	0.0000	-0.3014	-0.3601	0.8072	-0.0596
19/2	21/2	4	4	0	2.8636	0.0000	0.0000	2.3394	0.0000	1.6350
19/2	21/2	4	4	2	-0.3263	1.2697	-0.5841	-0.3184	0.4936	-0.6902
19/2	21/2	4	4	4	0.0000	0.0000	0.3590	0.4589	-0.8573	0.0269
21/2	21/2	2	0	2	-0.4458	0.1365	0.7112	0.3105	0.1452	0.4180
21/2	21/2	2	2	0	2.1805	0.0000	0.0000	2.0708	0.0000	1.9097
21/2	21/2	2	2	2	0.5412	-0.0000	-0.7838	-0.3958	-0.0000	-0.5727
21/2	21/2	2	2	4	0.0000	0.0000	-0.6395	-0.6887	0.0000	0.1105
21/2	21/2	2	4	2	-0.7000	-0.5001	1.0383	0.4250	-0.5039	0.4467
21/2	21/2	2	4	4	0.0000	0.0000	0.5921	0.6516	0.2189	-0.0981
21/2	21/2	4	0	4	0.0000	0.0000	-0.5262	-0.5595	0.2685	0.0778
21/2	21/2	4	2	2	-0.7000	0.5001	1.0383	0.4250	0.5039	0.4467
21/2	21/2	4	2	4	0.0000	0.0000	0.5921	0.6516	0.2189	-0.0981
21/2	21/2	4	4	0	2.7516	0.0000	0.0000	2.2826	0.0000	1.6463
21/2	21/2	4	4	2	0.7121	0.0000	-0.7301	-0.5445	-0.0000	-0.8226
21/2	21/2	4	4	4	0.0000	0.0000	-0.6064	-0.7098	0.0000	0.1166

$$F_{\lambda}^{\lambda_2 \lambda_1}(L L' l_2 l_1) \text{ for } l_1 = 11$$

 L, L'

l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
8	11	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4683
8	11	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1347
8	11	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6379
8	11	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0519
8	11	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1632
8	11	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0672
8	11	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0251
8	11	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5633
8	11	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0326
8	11	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.5625
8	11	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7300
8	11	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0469
9	11	2	0	2	0.0000	0.0000	0.0000	- 0.2727	- 0.5890	0.1591
9	11	2	2	0	0.0000	0.0000	0.0000	2.1751	0.0000	1.9938
9	11	2	2	2	0.0000	0.0000	0.0000	0.3714	0.7020	- 0.0542
9	11	2	2	4	0.0000	0.0000	0.0000	- 0.1107	0.5232	- 0.1277
9	11	2	4	2	0.0000	0.0000	0.0000	- 0.6772	- 0.8534	- 0.5926
9	11	2	4	4	0.0000	0.0000	0.0000	0.1435	- 0.6103	0.1256
9	11	4	0	4	0.0000	0.0000	0.0000	- 0.0560	0.3024	- 0.0920
9	11	4	2	2	0.0000	0.0000	0.0000	- 0.3432	- 0.8649	0.5171
9	11	4	2	4	0.0000	0.0000	0.0000	0.0727	- 0.3779	0.1109
9	11	4	4	0	0.0000	0.0000	0.0000	2.7316	0.0000	1.9728
9	11	4	4	2	0.0000	0.0000	0.0000	0.4447	0.8406	- 0.2162
9	11	4	4	4	0.0000	0.0000	0.0000	- 0.1047	0.4946	- 0.1304
10	11	2	0	2	0.1938	- 0.8221	0.6376	0.2215	- 0.2630	0.4207
10	11	2	2	0	2.2083	0.0000	0.0000	2.0979	0.0000	1.9357
10	11	2	2	2	- 0.2639	1.0265	- 0.6441	- 0.2074	0.4363	- 0.4444
10	11	2	2	4	0.0000	0.0000	0.3884	0.4553	- 0.8497	0.0202
10	11	2	4	2	0.4813	- 1.4748	0.6819	- 0.0229	- 0.8554	- 0.0179
10	11	2	4	4	0.0000	0.0000	- 0.4189	- 0.5050	0.7626	0.0206
10	11	4	0	4	0.0000	0.0000	0.2545	0.2947	- 0.7000	0.0602
10	11	4	2	2	0.2529	- 1.1921	1.0702	0.4516	- 0.1348	0.6994
10	11	4	2	4	0.0000	0.0000	- 0.3950	- 0.3636	0.8081	- 0.0576
10	11	4	4	0	2.8758	0.0000	0.0000	2.3965	0.0000	1.7456
10	11	4	4	2	- 0.3277	1.2745	- 0.6111	- 0.3121	0.5009	- 0.6770
10	11	4	4	4	0.0000	0.0000	0.3622	0.4591	- 0.8568	0.0261
11	11	2	0	2	- 0.4459	0.1306	0.7117	0.3112	0.1389	0.4205
11	11	2	2	0	2.1852	0.0000	0.0000	2.0848	0.0000	1.9370
11	11	2	2	2	0.5406	- 0.0000	- 0.7900	- 0.3946	- 0.0000	- 0.5696
11	11	2	2	4	0.0000	0.0000	- 0.6394	- 0.6882	- 0.0000	0.1104
11	11	2	4	2	- 0.7015	- 0.4792	1.0478	0.4324	- 0.4853	0.4687
11	11	2	4	4	0.0000	0.0000	0.5936	0.6516	0.2092	- 0.0986
11	11	4	0	4	0.0000	0.0000	- 0.5269	- 0.5606	0.2571	0.0789
11	11	4	2	2	- 0.7015	0.4792	1.0478	0.4324	0.4853	0.4687
11	11	4	2	4	0.0000	0.0000	0.5936	0.6516	- 0.2092	- 0.0986
11	11	4	4	0	2.7727	0.0000	0.0000	2.3416	0.0000	1.7511
11	11	4	4	2	0.7097	- 0.0000	- 0.7602	- 0.5401	0.0000	- 0.8131
11	11	4	4	4	0.0000	0.0000	- 0.6099	- 0.7080	- 0.0000	0.1159

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 23/2$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
17/2	23/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4730
17/2	23/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1442
17/2	23/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6407
17/2	23/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0521
17/2	23/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1532
17/2	23/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0666
17/2	23/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0259
17/2	23/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5795
17/2	23/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0335
17/2	23/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.6021
17/2	23/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7413
17/2	23/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0476
19/2	23/2	2	0	2	0.0000	0.0000	0.0000	- 0.2748	- 0.5898	0.1519
19/2	23/2	2	2	0	0.0000	0.0000	0.0000	2.1805	0.0000	2.0153
19/2	23/2	2	2	2	0.0000	0.0000	0.0000	0.3723	0.7031	- 0.0494
19/2	23/2	2	2	4	0.0000	0.0000	0.0000	- 0.1110	0.5241	- 0.1276
19/2	23/2	2	4	2	0.0000	0.0000	0.0000	- 0.6702	- 0.8629	- 0.5679
19/2	23/2	2	4	4	0.0000	0.0000	0.0000	0.1420	- 0.6064	0.1253
19/2	23/2	4	0	4	0.0000	0.0000	0.0000	- 0.0575	0.3086	- 0.0930
19/2	23/2	4	2	2	0.0000	0.0000	0.0000	- 0.3506	- 0.8729	0.4986
19/2	23/2	4	2	4	0.0000	0.0000	0.0000	0.0743	- 0.3842	0.1116
19/2	23/2	4	4	0	0.0000	0.0000	0.0000	2.7552	0.0000	2.0591
19/2	23/2	4	4	2	0.0000	0.0000	0.0000	0.4485	0.8471	- 0.1983
19/2	23/2	4	4	4	0.0000	0.0000	0.0000	- 0.1056	0.4984	- 0.1303
21/2	23/2	2	0	2	0.1950	- 0.8242	0.6354	0.2189	- 0.2685	0.4180
21/2	23/2	2	2	0	2.2107	0.0000	0.0000	2.1096	0.0000	1.9609
21/2	23/2	2	2	2	- 0.2642	1.0272	- 0.6489	- 0.2060	0.4376	- 0.4408
21/2	23/2	2	2	4	0.0000	0.0000	0.3886	0.4553	- 0.8490	0.0200
21/2	23/2	2	4	2	0.4756	- 1.4738	0.6952	- 0.0097	- 0.8511	0.0105
21/2	23/2	2	4	4	0.0000	0.0000	- 0.4176	- 0.5018	0.7648	0.0189
21/2	23/2	4	0	4	0.0000	0.0000	0.2576	0.2984	- 0.7016	0.0584
21/2	23/2	4	2	2	0.2571	- 1.2025	1.0675	0.4454	- 0.1577	0.7032
21/2	23/2	4	2	4	0.0000	0.0000	- 0.3082	- 0.3668	0.8088	- 0.0558
21/2	23/2	4	4	0	2.8864	0.0000	0.0000	2.4465	0.0000	1.8439
21/2	23/2	4	4	2	- 0.3289	1.2788	- 0.6347	- 0.3066	0.5074	- 0.6651
21/2	23/2	4	4	4	0.0000	0.0000	0.3649	0.4592	- 0.8563	0.0253
23/2	23/2	2	0	2	- 0.4460	0.1251	0.7121	0.3119	0.1332	0.4227
23/2	23/2	2	2	0	2.1894	0.0000	0.0000	2.0970	0.0000	1.9610
23/2	23/2	2	2	2	0.5401	- 0.0000	- 0.7955	- 0.3936	- 0.0000	- 0.5668
23/2	23/2	2	2	4	0.0000	0.0000	- 0.6394	- 0.6878	- 0.0000	0.1102
23/2	23/2	2	4	2	- 0.7028	- 0.4599	1.0561	0.4388	- 0.4680	0.4881
23/2	23/2	2	4	4	0.0000	0.0000	0.5949	0.6516	0.2703	- 0.0990
23/2	23/2	4	0	4	0.0000	0.0000	- 0.5275	- 0.5615	0.2766	0.0799
23/2	23/2	4	2	2	- 0.7028	0.4599	1.0561	0.4388	0.4680	0.4881
23/2	23/2	4	2	4	0.0000	0.0000	0.5949	0.6516	- 0.2003	- 0.0990
23/2	23/2	4	4	0	2.7913	0.0000	0.0000	2.3936	0.0000	1.8447
23/2	23/2	4	4	2	0.7075	- 0.0000	- 0.7868	- 0.5362	- 0.0000	- 0.8045
23/2	23/2	4	4	4	0.0000	0.0000	- 0.6129	- 0.7064	- 0.0000	0.1154

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' l_2 l_1) \text{ for } l_1 = 12$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
9	12	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4772
9	12	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1524
9	12	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6431
9	12	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0523
9	12	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1439
9	12	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0661
9	12	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0267
9	12	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5943
9	12	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0343
9	12	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.6366
9	12	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7512
9	12	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0482
10	12	2	0	2	0.0000	0.0000	0.0000	- 0.2768	- 0.5905	0.1453
10	12	2	2	0	0.0000	0.0000	0.0000	2.1852	0.0000	2.0340
10	12	2	2	2	0.0000	0.0000	0.0000	0.3731	0.7041	- 0.0452
10	12	2	2	4	0.0000	0.0000	0.0000	- 0.1112	0.5248	- 0.1276
10	12	2	4	2	0.0000	0.0000	0.0000	- 0.6637	- 0.8712	- 0.5450
10	12	2	4	4	0.0000	0.0000	0.0000	0.1406	- 0.6028	0.1251
10	12	4	0	4	0.0000	0.0000	0.0000	- 0.0589	0.3143	- 0.0938
10	12	4	2	2	0.0000	0.0000	0.0000	- 0.3575	- 0.8799	0.4812
10	12	4	2	4	0.0000	0.0000	0.0000	0.0757	- 0.3900	0.1122
10	12	4	4	0	0.0000	0.0000	0.0000	2.7757	0.0000	2.1352
10	12	4	4	2	0.0000	0.0000	0.0000	0.4519	0.8527	- 0.1825
10	12	4	4	4	0.0000	0.0000	0.0000	- 0.1063	0.5017	- 0.1301
11	12	2	0	2	0.1962	- 0.8261	0.6334	0.2166	- 0.2735	0.4154
11	12	2	2	0	2.2127	0.0000	0.0000	2.1199	0.0000	1.9831
11	12	2	2	2	- 0.2645	1.0279	- 0.6530	- 0.2048	0.4388	- 0.4376
11	12	2	2	4	0.0000	0.0000	0.3889	0.4553	- 0.8484	0.0199
11	12	2	4	2	0.4704	- 1.4727	0.7073	0.0023	- 0.8466	0.0363
11	12	2	4	4	0.0000	0.0000	- 0.4163	- 0.4988	0.7669	0.0174
11	12	4	0	4	0.0000	0.0000	0.2605	0.3018	- 0.7031	0.0568
11	12	4	2	2	0.2611	- 1.2119	1.0647	0.4394	- 0.1786	0.7058
11	12	4	2	4	0.0000	0.0000	- 0.3112	- 0.3697	0.8094	- 0.0541
11	12	4	4	0	2.8956	0.0000	0.0000	2.4907	0.0000	1.9314
11	12	4	4	2	- 0.3300	1.2825	- 0.6555	- 0.3016	0.5131	- 0.6543
11	12	4	4	4	0.0000	0.0000	0.3674	0.4593	- 0.8558	0.0247
12	12	2	0	2	- 0.4461	0.1201	0.7125	0.3125	0.1279	0.4246
12	12	2	2	0	2.1931	0.0000	0.0000	2.1079	0.0000	1.9822
12	12	2	2	2	0.5397	0.0000	- 0.8003	- 0.3927	0.0000	- 0.5644
12	12	2	2	4	0.0000	0.0000	- 0.6394	- 0.6874	- 0.0000	0.1101
12	12	2	4	2	- 0.7039	- 0.4421	1.0634	0.4445	- 0.4516	0.5054
12	12	2	4	4	0.0000	0.0000	0.5960	0.6515	0.1922	- 0.0994
12	12	4	0	4	0.0000	0.0000	- 0.5281	- 0.5622	0.2369	0.0807
12	12	4	2	2	- 0.7039	0.4421	1.0634	0.4445	0.4516	0.5054
12	12	4	2	4	0.0000	0.0000	0.5960	0.6515	- 0.1922	- 0.0994
12	12	4	4	0	2.8077	0.0000	0.0000	2.4398	0.0000	1.9285
12	12	4	4	2	0.7057	0.0000	- 0.8104	- 0.5326	0.0000	- 0.7966
12	12	4	4	4	0.0000	0.0000	- 0.6155	- 0.7050	- 0.0000	0.1149

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' I_2 I_1) \text{ for } I_1 = 25/2$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
19/2	25/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4810
19/2	25/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1595
19/2	25/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6453
19/2	25/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0525
19/2	25/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1352
19/2	25/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0656
19/2	25/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0275
19/2	25/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6077
19/2	25/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0351
19/2	25/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.6668
19/2	25/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7598
19/2	25/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0488
21/2	25/2	2	0	2	0.0000	0.0000	0.0000	- 0.2786	- 0.5911	0.1393
21/2	25/2	2	2	0	0.0000	0.0000	0.0000	2.1894	0.0000	2.0504
21/2	25/2	2	2	2	0.0000	0.0000	0.0000	0.3738	0.7049	- 0.0415
21/2	25/2	2	2	4	0.0000	0.0000	0.0000	- 0.1115	0.5254	- 0.1275
21/2	25/2	2	4	2	0.0000	0.0000	0.0000	- 0.6577	- 0.8784	- 0.5237
21/2	25/2	2	4	4	0.0000	0.0000	0.0000	0.1393	- 0.5994	0.1249
21/2	25/2	4	0	4	0.0000	0.0000	0.0000	- 0.0603	0.3196	- 0.0945
21/2	25/2	4	2	2	0.0000	0.0000	0.0000	- 0.3638	- 0.8861	0.4649
21/2	25/2	4	2	4	0.0000	0.0000	0.0000	0.0771	- 0.3952	0.1127
21/2	25/2	4	4	0	0.0000	0.0000	0.0000	2.7938	0.0000	2.2026
21/2	25/2	4	4	2	0.0000	0.0000	0.0000	0.4548	0.8577	- 0.1685
21/2	25/2	4	4	4	0.0000	0.0000	0.0000	- 0.1070	0.5046	- 0.1300
23/2	25/2	2	0	2	0.1973	- 0.8279	0.6315	0.2144	- 0.2781	0.4129
23/2	25/2	2	2	0	2.2146	0.0000	0.0000	2.1290	0.0000	2.0027
23/2	25/2	2	2	2	- 0.2647	1.0284	- 0.6567	- 0.2037	0.4398	- 0.4348
23/2	25/2	2	2	4	0.0000	0.0000	0.3890	0.4553	- 0.8479	0.0197
23/2	25/2	2	4	2	0.4657	- 1.4715	0.7183	0.0134	- 0.8419	0.0600
23/2	25/2	2	4	4	0.0000	0.0000	- 0.4151	- 0.4961	0.7687	0.0160
23/2	25/2	4	0	4	0.0000	0.0000	0.2631	0.3050	- 0.7043	0.0553
23/2	25/2	4	2	2	0.2647	- 1.2204	1.0620	0.4338	- 0.1978	0.7074
23/2	25/2	4	2	4	0.0000	0.0000	- 0.3139	- 0.3723	0.8099	- 0.0526
23/2	25/2	4	4	0	2.9038	0.0000	0.0000	2.5298	0.0000	2.0096
23/2	25/2	4	4	2	- 0.3309	1.2858	- 0.6739	- 0.2973	0.5181	- 0.6446
23/2	25/2	4	4	4	0.0000	0.0000	0.3695	0.4594	- 0.8554	0.0241
25/2	25/2	2	0	2	- 0.4462	0.1155	0.7129	0.3130	0.1230	0.4263
25/2	25/2	2	2	0	2.1963	0.0000	0.0000	2.1175	0.0000	2.0011
25/2	25/2	2	2	2	0.5393	- 0.0000	- 0.8046	- 0.3919	- 0.0000	- 0.5622
25/2	25/2	2	2	4	0.0000	0.0000	- 0.6393	- 0.6871	- 0.0000	0.1100
25/2	25/2	2	4	2	- 0.7049	- 0.4256	1.0699	0.4496	- 0.4363	0.5208
25/2	25/2	2	4	4	0.0000	0.0000	0.5970	0.6515	0.1847	- 0.0997
25/2	25/2	4	0	4	0.0000	0.0000	- 0.5285	- 0.5629	0.2280	0.0815
25/2	25/2	4	2	2	- 0.7049	0.4256	1.0699	0.4496	0.4363	0.5208
25/2	25/2	4	2	4	0.0000	0.0000	0.5970	0.6515	- 0.1847	- 0.0997
25/2	25/2	4	4	0	2.8222	0.0000	0.0000	2.4810	0.0000	2.0038
25/2	25/2	4	4	2	0.7040	0.0000	- 0.8315	- 0.5295	0.0000	- 0.7893
25/2	25/2	4	4	4	0.0000	0.0000	- 0.6178	- 0.7038	- 0.0000	0.1145

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' L_2 L_1) \text{ for } L_1 = 13$$

L_2	L_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
10	13	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4344
10	13	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1658
10	13	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6472
10	13	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0526
10	13	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1270
10	13	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0651
10	13	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0281
10	13	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6201
10	13	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0358
10	13	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.6935
10	13	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7674
10	13	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0493
11	13	2	0	2	0.0000	0.0000	0.0000	- 0.2803	- 0.5916	0.1338
11	13	2	2	0	0.0000	0.0000	0.0000	2.1931	0.0000	2.0649
11	13	2	2	2	0.0000	0.0000	0.0000	0.3745	0.7056	- 0.0383
11	13	2	2	4	0.0000	0.0000	0.0000	- 0.1116	0.5260	- 0.1274
11	13	2	4	2	0.0000	0.0000	0.0000	- 0.6521	- 0.8848	- 0.5039
11	13	2	4	4	0.0000	0.0000	0.0000	0.1382	- 0.5962	0.1247
11	13	4	0	4	0.0000	0.0000	0.0000	- 0.0615	0.3244	- 0.0952
11	13	4	2	2	0.0000	0.0000	0.0000	- 0.3696	- 0.8916	0.4494
11	13	4	2	4	0.0000	0.0000	0.0000	0.0783	- 0.4000	0.1132
11	13	4	4	0	0.0000	0.0000	0.0000	2.8098	0.0000	2.2625
11	13	4	4	2	0.0000	0.0000	0.0000	0.4574	0.8620	- 0.1559
11	13	4	4	4	0.0000	0.0000	0.0000	- 0.1077	0.5072	- 0.1299
12	13	2	0	2	0.1983	- 0.8295	0.6297	0.2124	- 0.2823	0.4106
12	13	2	2	0	2.2162	0.0000	0.0000	2.1370	0.0000	2.0201
12	13	2	2	2	- 0.2649	1.0289	- 0.6600	- 0.2027	0.4407	- 0.4323
12	13	2	2	4	0.0000	0.0000	0.3892	0.4553	- 0.8474	0.0196
12	13	2	4	2	0.4613	- 1.4702	0.7283	0.0235	- 0.8372	0.0817
12	13	2	4	4	0.0000	0.0000	- 0.4139	- 0.4937	0.7704	0.0147
12	13	4	0	4	0.0000	0.0000	0.2655	0.3079	- 0.7053	0.0538
12	13	4	2	2	0.2681	- 1.2282	1.0593	0.4285	- 0.2153	0.7082
12	13	4	2	4	0.0000	0.0000	- 0.3164	- 0.3748	0.8102	- 0.0512
12	13	4	4	0	2.9111	0.0000	0.0000	2.5645	0.0000	2.0798
12	13	4	4	2	- 0.3318	1.2887	- 0.6903	- 0.2934	0.5225	- 0.6357
12	13	4	4	4	0.0000	0.0000	0.3714	0.4594	- 0.8551	0.0237
13	13	2	0	2	- 0.4463	0.1112	0.7132	0.3135	0.1185	0.4278
13	13	2	2	0	2.1992	0.0000	0.0000	2.1261	0.0000	2.0180
13	13	2	2	2	0.5389	0.0000	- 0.8084	- 0.3911	0.0000	- 0.5602
13	13	2	2	4	0.0000	0.0000	- 0.6393	- 0.6868	0.0000	0.1099
13	13	2	4	2	- 0.7058	- 0.4103	1.0757	0.4541	- 0.4219	0.5346
13	13	2	4	4	0.0000	0.0000	0.5979	0.6515	0.1778	- 0.1000
13	13	4	0	4	0.0000	0.0000	- 0.5290	- 0.5636	0.2196	0.0822
13	13	4	2	2	- 0.7058	0.4103	1.0757	0.4541	0.4219	0.5346
13	13	4	2	4	0.0000	0.0000	0.5979	0.6515	- 0.1778	- 0.1000
13	13	4	4	0	2.8352	0.0000	0.0000	2.5178	0.0000	2.0716
13	13	4	4	2	0.7025	0.0000	- 0.8503	- 0.5267	0.0000	- 0.7827
13	13	4	4	4	0.0000	0.0000	- 0.6199	- 0.7027	0.0000	0.1141

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' l_2 l_1) \text{ for } l_1 = 27/2$$

					L, L'					
l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
21/2	27/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4876
21/2	27/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1714
21/2	27/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6488
21/2	27/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0528
21/2	27/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1193
21/2	27/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0647
21/2	27/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0288
21/2	27/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6314
21/2	27/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0365
21/2	27/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.7171
21/2	27/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7741
21/2	27/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0497
23/2	27/2	2	0	2	0.0000	0.0000	0.0000	- 0.2818	- 0.5921	0.1287
23/2	27/2	2	2	0	0.0000	0.0000	0.0000	2.1963	0.0000	2.0778
23/2	27/2	2	2	2	0.0000	0.0000	0.0000	0.3750	0.7063	- 0.0354
23/2	27/2	2	2	4	0.0000	0.0000	0.0000	- 0.1118	0.5264	- 0.1274
23/2	27/2	2	4	2	0.0000	0.0000	0.0000	- 0.6469	- 0.8904	- 0.4854
23/2	27/2	2	4	4	0.0000	0.0000	0.0000	0.1371	- 0.5933	0.1246
23/2	27/2	4	0	4	0.0000	0.0000	0.0000	- 0.0626	0.3289	- 0.0957
23/2	27/2	4	2	2	0.0000	0.0000	0.0000	- 0.3750	- 0.8965	0.4349
23/2	27/2	4	2	4	0.0000	0.0000	0.0000	0.0795	- 0.4043	0.1136
23/2	27/2	4	4	0	0.0000	0.0000	0.0000	2.8241	0.0000	2.3160
23/2	27/2	4	4	2	0.0000	0.0000	0.0000	0.4598	0.8659	- 0.1448
23/2	27/2	4	4	4	0.0000	0.0000	0.0000	- 0.1082	0.5095	- 0.1298
25/2	27/2	2	0	2	0.1992	- 0.8309	0.6281	0.2106	- 0.2861	0.4084
25/2	27/2	2	2	0	2.2176	0.0000	0.0000	2.1442	0.0000	2.0356
25/2	27/2	2	2	2	- 0.2651	1.0294	- 0.6629	- 0.2019	0.4415	- 0.4300
25/2	27/2	2	2	4	0.0000	0.0000	0.3894	0.4553	- 0.8470	0.0195
25/2	27/2	2	4	2	0.4573	- 1.4689	0.7375	0.0329	- 0.8325	0.1017
25/2	27/2	2	4	4	0.0000	0.0000	- 0.4128	- 0.4914	0.7719	0.0135
25/2	27/2	4	0	4	0.0000	0.0000	0.2678	0.3106	- 0.7062	0.0525
25/2	27/2	4	2	2	0.2712	- 1.2353	1.0567	0.4235	- 0.2315	0.7084
25/2	27/2	4	2	4	0.0000	0.0000	- 0.3186	- 0.3770	0.8105	- 0.0499
25/2	27/2	4	4	0	2.9176	0.0000	0.0000	2.5956	0.0000	2.1429
25/2	27/2	4	4	2	- 0.3325	1.2913	- 0.7050	- 0.2899	0.5265	- 0.6277
25/2	27/2	4	4	4	0.0000	0.0000	0.3731	0.4595	- 0.8547	0.0232
27/2	27/2	2	0	2	- 0.4464	0.1072	0.7135	0.3139	0.1142	0.4292
27/2	27/2	2	2	0	2.2018	0.0000	0.0000	2.1338	0.0000	2.0331
27/2	27/2	2	2	2	0.5386	0.0000	- 0.8118	- 0.3905	0.0000	- 0.5585
27/2	27/2	2	2	4	0.0000	0.0000	- 0.6393	- 0.6865	- 0.0000	0.1098
27/2	27/2	2	4	2	- 0.7066	- 0.3960	1.0809	0.4581	- 0.4084	0.5470
27/2	27/2	2	4	4	0.0000	0.0000	0.5987	0.6515	0.1713	- 0.1003
27/2	27/2	4	0	4	0.0000	0.0000	- 0.5294	- 0.5641	0.2119	0.0828
27/2	27/2	4	2	2	- 0.7066	0.3960	1.0809	0.4581	0.4084	0.5470
27/2	27/2	4	2	4	0.0000	0.0000	0.5987	0.6515	- 0.1713	- 0.1003
27/2	27/2	4	4	0	2.8467	0.0000	0.0000	2.5508	0.0000	2.1329
27/2	27/2	4	4	2	0.7012	0.0000	- 0.8672	- 0.5241	0.0000	- 0.7766
27/2	27/2	4	4	4	0.0000	0.0000	- 0.6217	- 0.7018	- 0.0000	0.1138

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' l_2 l_1) \text{ for } l_1 = 14$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
11	14	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4905
11	14	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1763
11	14	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6503
11	14	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0529
11	14	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1120
11	14	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0643
11	14	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0293
11	14	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6419
11	14	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0371
11	14	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.7381
11	14	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7801
11	14	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0501
12	14	2	0	2	0.0000	0.0000	0.0000	- 0.2833	- 0.5925	0.1239
12	14	2	2	0	0.0000	0.0000	0.0000	2.1992	0.0000	2.0892
12	14	2	2	2	0.0000	0.0000	0.0000	0.3755	0.7069	- 0.0329
12	14	2	2	4	0.0000	0.0000	0.0000	- 0.1120	0.5269	- 0.1273
12	14	2	4	2	0.0000	0.0000	0.0000	- 0.6421	- 0.8954	- 0.4682
12	14	2	4	4	0.0000	0.0000	0.0000	0.1361	- 0.5905	0.1245
12	14	4	0	4	0.0000	0.0000	0.0000	- 0.0637	0.3331	- 0.0963
12	14	4	2	2	0.0000	0.0000	0.0000	- 0.3800	- 0.9008	0.4212
12	14	4	2	4	0.0000	0.0000	0.0000	0.0805	- 0.4084	0.1140
12	14	4	4	0	0.0000	0.0000	0.0000	2.8368	0.0000	2.3640
12	14	4	4	2	0.0000	0.0000	0.0000	0.4618	0.8694	- 0.1347
12	14	4	4	4	0.0000	0.0000	0.0000	- 0.1087	0.5115	- 0.1297
13	14	2	0	2	0.2001	- 0.8323	0.6266	0.2089	- 0.2897	0.4063
13	14	2	2	0	2.2189	0.0000	0.0000	2.1507	0.0000	2.0496
13	14	2	2	2	- 0.2652	1.0298	- 0.6655	- 0.2011	0.4422	- 0.4280
13	14	2	2	4	0.0000	0.0000	0.3895	0.4553	- 0.8466	0.0194
13	14	2	4	2	0.4535	- 1.4675	0.7459	0.0415	- 0.8279	0.1201
13	14	2	4	4	0.0000	0.0000	- 0.4117	- 0.4893	0.7733	0.0124
13	14	4	0	4	0.0000	0.0000	0.2699	0.3131	- 0.7069	0.0513
13	14	4	2	2	0.2741	- 1.2418	1.0541	0.4187	- 0.2465	0.7081
13	14	4	2	4	0.0000	0.0000	- 0.3208	- 0.3791	0.8107	- 0.0486
13	14	4	4	0	2.9234	0.0000	0.0000	2.6235	0.0000	2.1999
13	14	4	4	2	- 0.3331	1.2936	- 0.7181	- 0.2868	0.5301	- 0.6204
13	14	4	4	4	0.0000	0.0000	0.3746	0.4595	- 0.8544	0.0229
14	14	2	0	2	- 0.4464	0.1035	0.7137	0.3143	0.1103	0.4304
14	14	2	2	0	2.2041	0.0000	0.0000	2.1407	0.0000	2.0467
14	14	2	2	2	0.5383	- 0.0000	- 0.8149	- 0.3899	- 0.0000	- 0.5569
14	14	2	2	4	0.0000	0.0000	- 0.6392	- 0.6863	0.0000	0.1097
14	14	2	4	2	- 0.7073	- 0.3827	1.0855	0.4618	- 0.3956	0.5582
14	14	2	4	4	0.0000	0.0000	0.5994	0.6515	0.1653	- 0.1005
14	14	4	0	4	0.0000	0.0000	- 0.5297	- 0.5646	0.2047	0.0833
14	14	4	2	2	- 0.7073	0.3827	1.0855	0.4618	0.3956	0.5582
14	14	4	2	4	0.0000	0.0000	0.5994	0.6515	- 0.1653	- 0.1005
14	14	4	4	0	2.8571	0.0000	0.0000	2.5806	0.0000	2.1884
14	14	4	4	2	0.7000	- 0.0000	- 0.8824	- 0.5218	- 0.0000	- 0.7711
14	14	4	4	4	0.0000	0.0000	- 0.6233	- 0.7009	- 0.0000	0.1135

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 29/2$$

					L, L'					
l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
23/2	29/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4932
23/2	29/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1806
23/2	29/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6516
23/2	29/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0530
23/2	29/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.1052
23/2	29/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0639
23/2	29/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0299
23/2	29/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6516
23/2	29/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0377
23/2	29/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.7568
23/2	29/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7854
23/2	29/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0504
25/2	29/2	2	0	2	0.0000	0.0000	0.0000	- 0.2846	- 0.5929	0.1195
25/2	29/2	2	2	0	0.0000	0.0000	0.0000	2.2018	0.0000	2.0995
25/2	29/2	2	2	2	0.0000	0.0000	0.0000	0.3760	0.7074	- 0.0306
25/2	29/2	2	2	4	0.0000	0.0000	0.0000	- 0.1121	0.5273	- 0.1273
25/2	29/2	2	4	2	0.0000	0.0000	0.0000	- 0.6377	- 0.8999	- 0.4521
25/2	29/2	2	4	4	0.0000	0.0000	0.0000	0.1351	- 0.5879	0.1243
25/2	29/2	4	0	4	0.0000	0.0000	0.0000	- 0.0647	0.3370	- 0.0968
25/2	29/2	4	2	2	0.0000	0.0000	0.0000	- 0.3847	- 0.9048	0.4082
25/2	29/2	4	2	4	0.0000	0.0000	0.0000	0.0815	- 0.4122	0.1144
25/2	29/2	4	4	0	0.0000	0.0000	0.0000	2.8481	0.0000	2.4071
25/2	29/2	4	4	2	0.0000	0.0000	0.0000	0.4637	0.8725	- 0.1256
25/2	29/2	4	4	4	0.0000	0.0000	0.0000	- 0.1091	0.5133	- 0.1296
27/2	29/2	2	0	2	0.2009	- 0.8336	0.6252	0.2072	- 0.2930	0.4043
27/2	29/2	2	2	0	2.2201	0.0000	0.0000	2.1564	0.0000	2.0621
27/2	29/2	2	2	2	- 0.2654	1.0302	- 0.6678	- 0.2004	0.4429	- 0.4262
27/2	29/2	2	2	4	0.0000	0.0000	0.3896	0.4553	- 0.8463	0.0193
27/2	29/2	2	4	2	0.4501	- 1.4661	0.7537	0.0495	- 0.8233	0.1371
27/2	29/2	2	4	4	0.0000	0.0000	- 0.4107	- 0.4873	0.7746	0.0114
27/2	29/2	4	0	4	0.0000	0.0000	0.2718	0.3154	- 0.7076	0.0501
27/2	29/2	4	2	2	0.2769	- 1.2478	1.0516	0.4142	- 0.2603	0.7074
27/2	29/2	4	2	4	0.0000	0.0000	- 0.3227	- 0.3811	0.8109	- 0.0475
27/2	29/2	4	4	0	2.9286	0.0000	0.0000	2.6487	0.0000	2.2515
27/2	29/2	4	4	2	- 0.3337	1.2957	- 0.7299	- 0.2840	0.5333	- 0.6138
27/2	29/2	4	4	4	0.0000	0.0000	0.3760	0.4595	- 0.8542	0.0225
29/2	29/2	2	0	2	- 0.4465	0.1001	0.7139	0.3146	0.1067	0.4315
29/2	29/2	2	2	0	2.2062	0.0000	0.0000	2.1469	0.0000	2.0590
29/2	29/2	2	2	2	0.5381	- 0.0000	- 0.8177	- 0.3894	- 0.0000	- 0.5554
29/2	29/2	2	2	4	0.0000	0.0000	- 0.6392	- 0.6860	- 0.0000	0.1096
29/2	29/2	2	4	2	- 0.7080	- 0.3702	1.0897	0.4650	- 0.3836	0.5684
29/2	29/2	2	4	4	0.0000	0.0000	0.6000	0.6515	0.1598	- 0.1008
29/2	29/2	4	0	4	0.0000	0.0000	- 0.5300	- 0.5651	0.1980	0.0838
29/2	29/2	4	2	2	- 0.7080	0.3702	1.0897	0.4650	0.3836	0.5684
29/2	29/2	4	2	4	0.0000	0.0000	0.6000	0.6515	- 0.1598	- 0.1008
29/2	29/2	4	4	0	2.8665	0.0000	0.0000	2.6076	0.0000	2.2389
29/2	29/2	4	4	2	0.6990	0.0000	- 0.8962	- 0.5197	0.0000	- 0.7660
29/2	29/2	4	4	4	0.0000	0.0000	- 0.6248	- 0.7002	- 0.0000	0.1132

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' L_2 L_1) \text{ for } L_1 = 15$$

L_2	L_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
12	15	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4957
12	15	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1845
12	15	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6528
12	15	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0531
12	15	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0987
12	15	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0635
12	15	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0304
12	15	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6606
12	15	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0382
12	15	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.7736
12	15	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7902
12	15	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0507
13	15	2	0	2	0.0000	0.0000	0.0000	- 0.2858	- 0.5932	0.1154
13	15	2	2	0	0.0000	0.0000	0.0000	2.2041	0.0000	2.1088
13	15	2	2	2	0.0000	0.0000	0.0000	0.3763	0.7079	- 0.0285
13	15	2	2	4	0.0000	0.0000	0.0000	- 0.1122	0.5276	- 0.1273
13	15	2	4	2	0.0000	0.0000	0.0000	- 0.6335	- 0.9039	- 0.4370
13	15	2	4	4	0.0000	0.0000	0.0000	0.1342	- 0.5855	0.1242
13	15	4	0	4	0.0000	0.0000	0.0000	- 0.0656	0.3406	- 0.0972
13	15	4	2	2	0.0000	0.0000	0.0000	- 0.3890	- 0.9083	0.3960
13	15	4	2	4	0.0000	0.0000	0.0000	0.0824	- 0.4156	0.1147
13	15	4	4	0	0.0000	0.0000	0.0000	2.8583	0.0000	2.4461
13	15	4	4	2	0.0000	0.0000	0.0000	0.4653	0.8753	- 0.1175
13	15	4	4	4	0.0000	0.0000	0.0000	- 0.1095	0.5150	- 0.1295
14	15	2	0	2	0.2016	- 0.8347	0.6239	0.2057	- 0.2960	0.4024
14	15	2	2	0	2.2211	0.0000	0.0000	2.1616	0.0000	2.0734
14	15	2	2	2	- 0.2655	1.0305	- 0.6699	- 0.1998	0.4434	- 0.4246
14	15	2	2	4	0.0000	0.0000	0.3897	0.4553	- 0.8460	0.0192
14	15	2	4	2	0.4469	- 1.4647	0.7609	0.0570	- 0.8188	0.1529
14	15	2	4	4	0.0000	0.0000	- 0.4097	- 0.4855	0.7758	0.0105
14	15	4	0	4	0.0000	0.0000	0.2737	0.3176	- 0.7081	0.0490
14	15	4	2	2	0.2794	- 1.2534	1.0491	0.4099	- 0.2732	0.7065
14	15	4	2	4	0.0000	0.0000	- 0.3245	- 0.3829	0.8110	- 0.0465
14	15	4	4	0	2.9333	0.0000	0.0000	2.6714	0.0000	2.2984
14	15	4	4	2	- 0.3343	1.2975	- 0.7406	- 0.2814	0.5362	- 0.6077
14	15	4	4	4	0.0000	0.0000	0.3772	0.4596	- 0.8539	0.0222
15	15	2	0	2	- 0.4465	0.0968	0.7141	0.3149	0.1032	0.4325
15	15	2	2	0	2.2081	0.0000	0.0000	2.1526	0.0000	2.0701
15	15	2	2	2	0.5379	- 0.0000	- 0.8202	- 0.3889	0.0000	- 0.5541
15	15	2	2	4	0.0000	0.0000	- 0.6392	- 0.6859	0.0000	0.1096
15	15	2	4	2	- 0.7085	- 0.3585	1.0935	0.4680	- 0.3722	0.5776
15	15	2	4	4	0.0000	0.0000	0.6006	0.6515	0.1546	- 0.1009
15	15	4	0	4	0.0000	0.0000	- 0.5303	- 0.5655	0.1917	0.0843
15	15	4	2	2	- 0.7085	0.3585	1.0935	0.4680	0.3722	0.5776
15	15	4	2	4	0.0000	0.0000	0.6006	0.6515	- 0.1546	- 0.1009
15	15	4	4	0	2.8750	0.0000	0.0000	2.6321	0.0000	2.2849
15	15	4	4	2	0.6980	- 0.0000	- 0.9086	- 0.5178	0.0000	- 0.7613
15	15	4	4	4	0.0000	0.0000	- 0.6261	- 0.6995	- 0.0000	0.1130

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' L' l_2 l_1) \text{ for } l_1 = 31/2$$

L, L'

l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
25/2	31/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.4980
25/2	31/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1880
25/2	31/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6538
25/2	31/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0532
25/2	31/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0927
25/2	31/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0631
25/2	31/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0309
25/2	31/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6690
25/2	31/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0387
25/2	31/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.7888
25/2	31/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7945
25/2	31/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0510
27/2	31/2	2	0	2	0.0000	0.0000	0.0000	- 0.2869	- 0.5935	0.1116
27/2	31/2	2	2	0	0.0000	0.0000	0.0000	2.2062	0.0000	2.1171
27/2	31/2	2	2	2	0.0000	0.0000	0.0000	0.3767	0.7083	- 0.0266
27/2	31/2	2	2	4	0.0000	0.0000	0.0000	- 0.1123	0.5279	- 0.1272
27/2	31/2	2	4	2	0.0000	0.0000	0.0000	- 0.6296	- 0.9075	- 0.4229
27/2	31/2	2	4	4	0.0000	0.0000	0.0000	0.1334	- 0.5831	0.1241
27/2	31/2	4	0	4	0.0000	0.0000	0.0000	- 0.0665	0.3440	- 0.0976
27/2	31/2	4	2	2	0.0000	0.0000	0.0000	- 0.3931	- 0.9115	0.3845
27/2	31/2	4	2	4	0.0000	0.0000	0.0000	0.0833	- 0.4189	0.1150
27/2	31/2	4	4	0	0.0000	0.0000	0.0000	2.8676	0.0000	2.4814
27/2	31/2	4	4	2	0.0000	0.0000	0.0000	0.4668	0.8778	- 0.1100
27/2	31/2	4	4	4	0.0000	0.0000	0.0000	- 0.1099	0.5164	- 0.1294
29/2	31/2	2	0	2	0.2023	- 0.8358	0.6227	0.2043	- 0.2989	0.4006
29/2	31/2	2	2	0	2.2221	0.0000	0.0000	2.1664	0.0000	2.0837
29/2	31/2	2	2	2	- 0.2656	1.0308	- 0.6718	- 0.1992	0.4440	- 0.4231
29/2	31/2	2	2	4	0.0000	0.0000	0.3898	0.4553	- 0.8457	0.0191
29/2	31/2	2	4	2	0.4439	- 1.4634	0.7676	0.0639	- 0.8144	0.1676
29/2	31/2	2	4	4	0.0000	0.0000	- 0.4088	- 0.4838	0.7769	0.0096
29/2	31/2	4	0	4	0.0000	0.0000	0.2754	0.3196	- 0.7086	0.0480
29/2	31/2	4	2	2	0.2819	- 1.2586	1.0467	0.4058	- 0.2851	0.7052
29/2	31/2	4	2	4	0.0000	0.0000	- 0.3262	- 0.3846	0.8111	- 0.0455
29/2	31/2	4	4	0	2.9375	0.0000	0.0000	2.6919	0.0000	2.3410
29/2	31/2	4	4	2	- 0.3348	1.2992	- 0.7503	- 0.2791	0.5388	- 0.6021
29/2	31/2	4	4	4	0.0000	0.0000	0.3784	0.4596	- 0.8537	0.0220
31/2	31/2	2	0	2	- 0.4466	0.0938	0.7143	0.3152	0.1000	0.4334
31/2	31/2	2	2	0	2.2098	0.0000	0.0000	2.1577	0.0000	2.0802
31/2	31/2	2	2	2	0.5377	0.0000	- 0.8224	- 0.3885	- 0.0000	- 0.5530
31/2	31/2	2	2	4	0.0000	0.0000	- 0.6392	- 0.6857	- 0.0000	0.1095
31/2	31/2	2	4	2	- 0.7091	- 0.3475	1.0970	0.4707	- 0.3615	0.5860
31/2	31/2	2	4	4	0.0000	0.0000	0.6011	0.6515	0.1497	- 0.1011
31/2	31/2	4	0	4	0.0000	0.0000	- 0.5306	- 0.5658	0.1857	0.0847
31/2	31/2	4	2	2	- 0.7091	0.3475	1.0970	0.4707	0.3615	0.5860
31/2	31/2	4	2	4	0.0000	0.0000	0.6011	0.6515	- 0.1497	- 0.1011
31/2	31/2	4	4	0	2.8827	0.0000	0.0000	2.6543	0.0000	2.3270
31/2	31/2	4	4	2	0.6971	0.0000	- 0.9200	- 0.5160	- 0.0000	- 0.7570
31/2	31/2	4	4	4	0.0000	0.0000	- 0.6273	- 0.6989	- 0.0000	0.1128

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 16$$

I_2	I_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
13	16	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5002
13	16	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1912
13	16	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6547
13	16	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0532
13	16	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0869
13	16	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0628
13	16	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0313
13	16	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.6768
13	16	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0391
13	16	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8025
13	16	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.7984
13	16	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0512
14	16	2	0	2	0.0000	0.0000	0.0000	- 0.2880	- 0.5937	0.1080
14	16	2	2	0	0.0000	0.0000	0.0000	2.2081	0.0000	2.1246
14	16	2	2	2	0.0000	0.0000	0.0000	0.3770	0.7087	- 0.0250
14	16	2	2	4	0.0000	0.0000	0.0000	- 0.1124	0.5282	- 0.1272
14	16	2	4	2	0.0000	0.0000	0.0000	- 0.6259	- 0.9108	- 0.4096
14	16	2	4	4	0.0000	0.0000	0.0000	0.1326	- 0.5810	0.1240
14	16	4	0	4	0.0000	0.0000	0.0000	- 0.0674	0.3472	- 0.0980
14	16	4	2	2	0.0000	0.0000	0.0000	- 0.3969	- 0.9144	0.3735
14	16	4	2	4	0.0000	0.0000	0.0000	0.0841	- 0.4219	0.1152
14	16	4	4	0	0.0000	0.0000	0.0000	2.8759	0.0000	2.5134
14	16	4	4	2	0.0000	0.0000	0.0000	0.4682	0.8801	- 0.1033
14	16	4	4	4	0.0000	0.0000	0.0000	- 0.1102	0.5178	- 0.1293
15	16	2	0	2	0.2030	- 0.8368	0.6216	0.2030	- 0.3015	0.3989
15	16	2	2	0	2.2230	0.0000	0.0000	2.1706	0.0000	2.0930
15	16	2	2	2	- 0.2657	1.0310	- 0.6735	- 0.1987	0.4445	- 0.4218
15	16	2	2	4	0.0000	0.0000	0.3899	0.4553	- 0.8455	0.0191
15	16	2	4	2	0.4411	- 1.4620	0.7738	0.0704	- 0.8101	0.1812
15	16	2	4	4	0.0000	0.0000	- 0.4079	- 0.4822	0.7779	0.0087
15	16	4	0	4	0.0000	0.0000	0.2770	0.3215	- 0.7090	0.0470
15	16	4	2	2	0.2841	- 1.2633	1.0444	0.4019	- 0.2963	0.7038
15	16	4	2	4	0.0000	0.0000	- 0.3278	- 0.3862	0.8112	- 0.0446
15	16	4	4	0	2.9413	0.0000	0.0000	2.7107	0.0000	2.3800
15	16	4	4	2	- 0.3352	1.3008	- 0.7591	- 0.2770	0.5412	- 0.5970
15	16	4	4	4	0.0000	0.0000	0.3794	0.4596	- 0.8535	0.0217
16	16	2	0	2	- 0.4466	0.0910	0.7145	0.3155	0.0970	0.4342
16	16	2	2	0	2.2114	0.0000	0.0000	2.1624	0.0000	2.0895
16	16	2	2	2	0.5375	- 0.0000	- 0.8245	- 0.3881	- 0.0000	- 0.5519
16	16	2	2	4	0.0000	0.0000	- 0.6392	- 0.6855	0.0000	0.1095
16	16	2	4	2	- 0.7096	- 0.3372	1.1002	0.4732	- 0.3513	0.5937
16	16	2	4	4	0.0000	0.0000	0.6016	0.6514	0.1451	- 0.1013
16	16	4	0	4	0.0000	0.0000	- 0.5308	- 0.5662	0.1802	0.0851
16	16	4	2	2	- 0.7096	0.3372	1.1002	0.4732	0.3513	0.5937
16	16	4	2	4	0.0000	0.0000	0.6016	0.6514	- 0.1451	- 0.1013
16	16	4	4	0	2.8897	0.0000	0.0000	2.6746	0.0000	2.3654
16	16	4	4	2	0.6963	- 0.0000	- 0.9304	- 0.5144	- 0.0000	- 0.7530
16	16	4	4	4	0.0000	0.0000	- 0.6284	- 0.6983	0.0000	0.1126

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' l_2 l_1) \text{ for } l_1 = 33/2$$

					L, L'					
l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
27/2	33/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.5022
27/2	33/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1941
27/2	33/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6556
27/2	33/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0533
27/2	33/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	-1.0815
27/2	33/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0625
27/2	33/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0318
27/2	33/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.6841
27/2	33/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0395
27/2	33/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8148
27/2	33/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8020
27/2	33/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0515
29/2	33/2	2	0	2	0.0000	0.0000	0.0000	-0.2890	-0.5940	0.1046
29/2	33/2	2	2	0	0.0000	0.0000	0.0000	2.2098	0.0000	2.1315
29/2	33/2	2	2	2	0.0000	0.0000	0.0000	0.3773	0.7090	-0.0234
29/2	33/2	2	2	4	0.0000	0.0000	0.0000	-0.1125	0.5285	-0.1272
29/2	33/2	2	4	2	0.0000	0.0000	0.0000	-0.6224	-0.9138	-0.3971
29/2	33/2	2	4	4	0.0000	0.0000	0.0000	0.1319	-0.5789	0.1239
29/2	33/2	4	0	4	0.0000	0.0000	0.0000	-0.0682	0.3502	-0.0983
29/2	33/2	4	2	2	0.0000	0.0000	0.0000	-0.4004	-0.9170	0.3631
29/2	33/2	4	2	4	0.0000	0.0000	0.0000	0.0848	-0.4247	0.1155
29/2	33/2	4	4	0	0.0000	0.0000	0.0000	2.8835	0.0000	2.5426
29/2	33/2	4	4	2	0.0000	0.0000	0.0000	0.4694	0.8821	-0.0971
29/2	33/2	4	4	4	0.0000	0.0000	0.0000	-0.1105	0.5190	-0.1293
31/2	33/2	2	0	2	0.2036	-0.8378	0.6205	0.2017	-0.3040	0.3973
31/2	33/2	2	2	0	2.2237	0.0000	0.0000	2.1745	0.0000	2.1014
31/2	33/2	2	2	2	-0.2658	1.0313	-0.6751	-0.1982	0.4449	-0.4205
31/2	33/2	2	2	4	0.0000	0.0000	0.3900	0.4553	-0.8453	0.0190
31/2	33/2	2	4	2	0.4385	-1.4607	0.7796	0.0765	-0.8059	0.1940
31/2	33/2	2	4	4	0.0000	0.0000	-0.4070	-0.4807	0.7788	0.0079
31/2	33/2	4	0	4	0.0000	0.0000	0.2785	0.3233	-0.7094	0.0461
31/2	33/2	4	2	2	0.2863	-1.2678	1.0422	0.3982	-0.3068	0.7022
31/2	33/2	4	2	4	0.0000	0.0000	-0.3293	-0.3876	0.8112	-0.0437
31/2	33/2	4	4	0	2.9449	0.0000	-0.0000	2.7277	0.0000	2.4156
31/2	33/2	4	4	2	-0.3356	1.3022	-0.7672	-0.2751	0.5434	-0.5923
31/2	33/2	4	4	4	0.0000	0.0000	0.3803	0.4596	-0.8533	0.0215
33/2	33/2	2	0	2	-0.4466	0.0883	0.7146	0.3157	0.0942	0.4350
33/2	33/2	2	2	0	2.2128	0.0000	0.0000	2.1666	0.0000	2.0978
33/2	33/2	2	2	2	0.5373	0.0000	-0.8264	-0.3877	0.0000	-0.5509
33/2	33/2	2	2	4	0.0000	0.0000	-0.6391	-0.6854	-0.0000	-0.1094
33/2	33/2	2	4	2	-0.7100	-0.3274	1.1030	0.4754	-0.3417	0.6007
33/2	33/2	2	4	4	0.0000	0.0000	0.6020	0.6514	0.1408	-0.1014
33/2	33/2	4	0	4	0.0000	0.0000	-0.5310	-0.5665	0.1749	0.0854
33/2	33/2	4	2	2	-0.7100	0.3274	1.1030	0.4754	0.3417	0.6007
33/2	33/2	4	2	4	0.0000	0.0000	0.6020	0.6514	-0.1408	-0.1014
33/2	33/2	4	4	0	2.8961	0.0000	0.0000	2.6932	0.0000	2.4008
33/2	33/2	4	4	2	0.6956	0.0000	-0.9399	-0.5130	0.0000	-0.7493
33/2	33/2	4	4	4	0.0000	0.0000	-0.6294	-0.6978	-0.0000	0.1124

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' l_2 l_1) \text{ for } l_1 = 17$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
14	17	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.5040
14	17	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1966
14	17	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6564
14	17	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0534
14	17	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	-1.0764
14	17	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0622
14	17	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0322
14	17	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.6909
14	17	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0399
14	17	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8261
14	17	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8052
14	17	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0517
15	17	2	0	2	0.0000	0.0000	0.0000	-0.2899	-0.5942	0.1015
15	17	2	2	0	0.0000	0.0000	0.0000	2.2114	0.0000	2.1377
15	17	2	2	2	0.0000	0.0000	0.0000	0.3776	0.7093	-0.0220
15	17	2	2	4	0.0000	0.0000	0.0000	-0.1126	0.5287	-0.1272
15	17	2	4	2	0.0000	0.0000	0.0000	-0.6192	-0.9165	-0.3853
15	17	2	4	4	0.0000	0.0000	0.0000	0.1312	-0.5769	0.1238
15	17	4	0	4	0.0000	0.0000	0.0000	-0.0689	0.3530	-0.0987
15	17	4	2	2	0.0000	0.0000	0.0000	-0.4038	-0.9194	0.3533
15	17	4	2	4	0.0000	0.0000	0.0000	0.0856	-0.4274	0.1157
15	17	4	4	0	0.0000	0.0000	0.0000	2.8904	0.0000	2.5693
15	17	4	4	2	0.0000	0.0000	0.0000	0.4706	0.8840	-0.0915
15	17	4	4	4	0.0000	0.0000	0.0000	-0.1107	0.5201	-0.1292
16	17	2	0	2	0.2042	-0.8387	0.6195	0.2005	-0.3063	0.3958
16	17	2	2	0	2.2245	0.0000	0.0000	2.1781	0.0000	2.1092
16	17	2	2	2	-0.2659	1.0315	-0.6765	-0.1978	0.4453	-0.4194
16	17	2	2	4	0.0000	0.0000	0.3900	0.4553	-0.8451	0.0190
16	17	2	4	2	0.4360	-1.4593	0.7850	0.0822	-0.8019	0.2059
16	17	2	4	4	0.0000	0.0000	-0.4062	-0.4793	0.7797	0.0072
16	17	4	0	4	0.0000	0.0000	0.2799	0.3250	-0.7097	0.0452
16	17	4	2	2	0.2883	-1.2720	1.0400	0.3947	-0.3165	0.7006
16	17	4	2	4	0.0000	0.0000	-0.3307	-0.3890	0.3112	-0.0429
16	17	4	4	0	2.9481	0.0000	0.0000	2.7433	0.0000	2.4483
16	17	4	4	2	-0.3360	1.3034	-0.7745	-0.2733	0.5454	-0.5880
16	17	4	4	4	0.0000	0.0000	0.3812	0.4596	-0.8531	0.0213
17	17	2	0	2	-0.4467	0.0857	0.7148	0.3159	0.0915	0.4357
17	17	2	2	0	2.2141	0.0000	0.0000	2.1705	0.0000	2.1056
17	17	2	2	2	0.5371	0.0000	-0.8281	-0.3874	-0.0000	-0.5500
17	17	2	2	4	0.0000	0.0000	-0.6391	-0.6852	0.0000	0.1094
17	17	2	4	2	-0.7104	-0.3182	1.1057	0.4775	-0.3325	0.6071
17	17	2	4	4	0.0000	0.0000	0.6024	0.6514	0.1368	-0.1015
17	17	4	0	4	0.0000	0.0000	-0.5312	-0.5668	0.1700	0.0857
17	17	4	2	2	-0.7104	0.3182	1.1057	0.4775	0.3325	0.6071
17	17	4	2	4	0.0000	0.0000	0.6024	0.6514	-0.1368	-0.1015
17	17	4	4	0	2.9020	0.0000	0.0000	2.7102	0.0000	2.4333
17	17	4	4	2	0.6949	0.0000	-0.9486	-0.5116	0.0000	-0.7459
17	17	4	4	4	0.0000	0.0000	-0.6303	-0.6973	0.0000	0.1122

$$F_{\lambda}^{\lambda_2 \lambda_1} (L L' I_2 I_1) \text{ for } I_1 = 35/2$$

 L, L'

I_2	I_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
29/2	35/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.5058
29/2	35/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.1990
29/2	35/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6571
29/2	35/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0534
29/2	35/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	-1.0715
29/2	35/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0619
29/2	35/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0325
29/2	35/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	-0.6973
29/2	35/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	-0.0403
29/2	35/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8364
29/2	35/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8081
29/2	35/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0519
31/2	35/2	2	0	2	0.0000	0.0000	0.0000	-0.2908	-0.5944	0.0985
31/2	35/2	2	2	0	0.0000	0.0000	0.0000	2.2128	0.0000	2.1434
31/2	35/2	2	2	2	0.0000	0.0000	0.0000	0.3778	0.7096	-0.0208
31/2	35/2	2	2	4	0.0000	0.0000	0.0000	-0.1126	0.5289	-0.1271
31/2	35/2	2	4	2	0.0000	0.0000	0.0000	-0.6161	-0.9189	-0.3741
31/2	35/2	2	4	4	0.0000	0.0000	0.0000	0.1305	-0.5751	0.1238
31/2	35/2	4	0	4	0.0000	0.0000	0.0000	-0.0696	0.3557	-0.0989
31/2	35/2	4	2	2	0.0000	0.0000	0.0000	-0.4069	-0.9217	0.3440
31/2	35/2	4	2	4	0.0000	0.0000	0.0000	0.0862	-0.4299	0.1159
31/2	35/2	4	4	0	0.0000	0.0000	0.0000	2.8967	0.0000	2.5937
31/2	35/2	4	4	2	0.0000	0.0000	0.0000	0.4716	0.8857	-0.0863
31/2	35/2	4	4	4	0.0000	0.0000	0.0000	-0.1110	0.5211	-0.1291
33/2	35/2	2	0	2	0.2047	-0.8395	0.6185	0.1994	-0.3085	0.3943
33/2	35/2	2	2	0	2.2251	0.0000	0.0000	2.1814	0.0000	2.1163
33/2	35/2	2	2	2	-0.2660	1.0317	-0.6778	-0.1974	0.4457	-0.4184
33/2	35/2	2	2	4	0.0000	0.0000	0.3801	0.4553	-0.8449	0.0189
33/2	35/2	2	4	2	0.4337	-1.4581	0.7900	0.0875	-0.7979	0.2170
33/2	35/2	2	4	4	0.0000	0.0000	-0.4054	-0.4780	0.7805	0.0065
33/2	35/2	4	0	4	0.0000	0.0000	0.2812	0.3266	-0.7100	0.0444
33/2	35/2	4	2	2	0.2902	-1.2759	1.0379	0.3913	-0.3257	0.6988
33/2	35/2	4	2	4	0.0000	0.0000	-0.3320	-0.3903	0.8112	-0.0422
33/2	35/2	4	4	0	2.9510	0.0000	0.0000	2.7576	0.0000	2.4783
33/2	35/2	4	4	2	-0.3363	1.3046	-0.7813	-0.2717	0.5472	-0.5840
33/2	35/2	4	4	4	0.0000	0.0000	0.3819	0.4597	-0.8529	0.0211
35/2	35/2	2	0	2	-0.4467	0.0834	0.7149	0.3161	0.0889	0.4363
35/2	35/2	2	2	0	2.2153	0.0000	0.0000	2.1741	0.0000	2.1127
35/2	35/2	2	2	2	0.5370	0.0000	-0.8297	-0.3371	0.0000	-0.5482
35/2	35/2	2	2	4	0.0000	0.0000	-0.6391	-0.6851	0.0000	0.1093
35/2	35/2	2	4	2	-0.7108	-0.3095	1.1081	0.4794	-0.3238	0.6130
35/2	35/2	2	4	4	0.0000	0.0000	0.6028	0.6514	0.1329	-0.1017
35/2	35/2	4	0	4	0.0000	0.0000	-0.5314	-0.5670	0.1653	0.0860
35/2	35/2	4	2	2	-0.7108	-0.3095	1.1081	0.4794	0.3238	0.6130
35/2	35/2	4	2	4	0.0000	0.0000	0.6028	0.6514	-0.1329	-0.1017
35/2	35/2	4	4	0	2.9073	0.0000	0.0000	2.7259	0.0000	2.4632
35/2	35/2	4	4	2	0.6943	0.0000	-0.9566	-0.5104	0.0000	-0.7428
35/2	35/2	4	4	4	0.0000	0.0000	-0.6311	-0.6969	0.0000	0.1121

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' L_2 L_1) \text{ for } L_1 = 18$$

L_2	L_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
15	18	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5074
15	18	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.2012
15	18	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6577
15	18	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0535
15	18	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0669
15	18	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0616
15	18	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0900	0.0329
15	18	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.7033
15	18	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0406
15	18	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8458
15	18	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8108
15	18	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0520
16	18	2	0	2	0.0000	0.0000	0.0000	- 0.2917	- 0.5946	0.0957
16	18	2	2	0	0.0000	0.0000	0.0000	2.2141	0.0000	2.1486
16	18	2	2	2	0.0000	0.0000	0.0000	0.3781	0.7099	- 0.0196
16	18	2	2	4	0.0000	0.0000	0.0000	- 0.1127	0.5291	- 0.1271
16	18	2	4	2	0.0000	0.0000	0.0000	- 0.6132	- 0.9212	- 0.3636
16	18	2	4	4	0.0000	0.0000	0.0000	0.1299	- 0.5733	0.1237
16	18	4	0	4	0.0000	0.0000	0.0000	- 0.0703	0.3582	- 0.0992
16	18	4	2	2	0.0000	0.0000	0.0000	- 0.4099	- 0.9237	0.3351
16	18	4	2	4	0.0000	0.0000	0.0000	0.0869	- 0.4322	0.1161
16	13	4	4	0	0.0000	0.0000	0.0000	2.9025	0.0000	2.6161
16	18	4	4	2	0.0000	0.0000	0.0000	0.4725	0.8873	- 0.0816
16	18	4	4	4	0.0000	0.0000	0.0000	- 0.1112	0.5220	- 0.1291
17	18	2	0	2	0.2052	- 0.8403	0.6176	0.1983	- 0.3106	0.3929
17	18	2	2	0	2.2257	0.0000	0.0000	2.1844	0.0000	2.1228
17	18	2	2	2	- 0.2660	1.0319	- 0.6791	- 0.1971	0.4460	- 0.4174
17	18	2	2	4	0.0000	0.0000	0.3902	0.4553	- 0.8447	0.0189
17	18	2	4	2	0.4315	- 1.4568	0.7948	0.0926	- 0.7941	0.2275
17	18	2	4	4	0.0000	0.0000	- 0.4047	- 0.4767	0.7813	0.0059
17	18	4	0	4	0.0000	0.0000	0.2825	0.3281	- 0.7102	0.0436
17	18	4	2	2	0.2920	- 1.2795	1.0359	0.3881	- 0.3344	0.6969
17	13	4	2	4	0.0000	0.0000	- 0.3332	- 0.3916	0.8112	- 0.0415
17	18	4	4	0	2.9537	0.0000	0.0000	2.7708	0.0000	2.5060
17	18	4	4	2	- 0.3366	1.3057	- 0.7874	- 0.2702	0.5489	- 0.5803
17	18	4	4	4	0.0000	0.0000	0.3827	0.4597	- 0.8528	0.0210
18	18	2	0	2	- 0.4467	0.0811	0.7150	0.3163	0.0866	0.4369
18	18	2	2	0	2.2165	0.0000	0.0000	2.1774	0.0000	2.1192
18	18	2	2	2	0.5369	0.0000	- 0.8312	- 0.3868	- 0.0000	- 0.5484
18	18	2	2	4	0.0000	0.0000	- 0.6391	- 0.6850	- 0.0000	0.1093
18	18	2	4	2	- 0.7111	- 0.3013	1.1103	0.4811	- 0.3156	0.6185
18	18	2	4	4	0.0000	0.0000	0.6031	0.6514	0.1293	- 0.1018
18	18	4	0	4	0.0000	0.0000	- 0.5316	- 0.5672	0.1609	0.0863
18	18	4	2	2	- 0.7111	0.3013	1.1103	0.4811	0.3156	0.6185
18	18	4	2	4	0.0000	0.0000	0.6031	0.6514	- 0.1293	- 0.1018
18	18	4	4	0	2.9123	0.0000	0.0000	2.7403	0.0000	2.4909
18	18	4	4	2	0.6938	- 0.0000	- 0.9639	- 0.5093	- 0.0000	- 0.7398
18	18	4	4	4	0.0000	0.0000	- 0.6319	- 0.6965	- 0.0000	0.1120

$$F_{\lambda}^{\lambda_2 \lambda_1} (L' l_2 l_1) \text{ for } l_1 = 37/2$$

l_2	l_1	λ_2	λ_1	λ	L, L'					
					1,1	1,2	1,3	2,2	2,3	3,3
31/2	37/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5089
31/2	37/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.2031
31/2	37/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6583
31/2	37/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0535
31/2	37/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0625
31/2	37/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0614
31/2	37/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0332
31/2	37/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.7090
31/2	37/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0410
31/2	37/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8544
31/2	37/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8132
31/2	37/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0522
33/2	37/2	2	0	2	0.0000	0.0000	0.0000	- 0.2924	- 0.5948	0.0930
33/2	37/2	2	2	0	0.0000	0.0000	0.0000	2.2153	0.0000	2.1534
33/2	37/2	2	2	2	0.0000	0.0000	0.0000	0.3783	0.7101	- 0.0185
33/2	37/2	2	2	4	0.0000	0.0000	0.0000	- 0.1128	0.5293	- 0.1271
33/2	37/2	2	4	2	0.0000	0.0000	0.0000	- 0.6105	- 0.9232	- 0.3536
33/2	37/2	2	4	4	0.0000	0.0000	0.0000	0.1293	- 0.5717	0.1236
33/2	37/2	4	0	4	0.0000	0.0000	0.0000	- 0.0709	0.3605	- 0.0995
33/2	37/2	4	2	2	0.0000	0.0000	0.0000	- 0.4127	- 0.9255	0.3266
33/2	37/2	4	2	4	0.0000	0.0000	0.0000	0.0875	- 0.4344	0.1163
33/2	37/2	4	4	0	0.0000	0.0000	0.0000	2.9078	0.0000	2.6367
33/2	37/2	4	4	2	0.0000	0.0000	0.0000	0.4734	0.8887	- 0.0772
33/2	37/2	4	4	4	0.0000	0.0000	0.0000	- 0.1114	0.5229	- 0.1290
35/2	37/2	2	0	2	0.2057	- 0.8410	0.6168	0.1973	- 0.3125	0.3915
35/2	37/2	2	2	0	2.2263	0.0000	0.0000	2.1871	0.0000	2.1288
35/2	37/2	2	2	2	- 0.2661	1.0321	- 0.6802	- 0.1967	0.4463	- 0.4165
35/2	37/2	2	2	4	0.0000	0.0000	0.3902	0.4553	- 0.8446	0.0188
35/2	37/2	2	4	2	0.4294	- 1.4556	0.7992	0.0973	- 0.7904	0.2373
35/2	37/2	2	4	4	0.0000	0.0000	- 0.4040	- 0.4756	0.7820	0.0052
35/2	37/2	4	0	4	0.0000	0.0000	0.2837	0.3295	- 0.7104	0.0429
35/2	37/2	4	2	2	0.2537	- 1.2829	1.0340	0.3850	- 0.3425	0.6950
35/2	37/2	4	2	4	0.0000	0.0000	- 0.3344	- 0.3927	0.8112	- 0.0408
35/2	37/2	4	4	0	2.9561	0.0000	0.0000	2.7829	0.0000	2.5316
35/2	37/2	4	4	2	- 0.3369	1.3067	- 0.7931	- 0.2688	0.5504	- 0.5769
35/2	37/2	4	4	4	0.0000	0.0000	0.3833	0.4597	- 0.8526	0.0208
37/2	37/2	2	0	2	- 0.4467	0.0790	0.7151	0.3164	0.0843	0.4374
37/2	37/2	2	2	0	2.2175	0.0000	0.0000	2.1804	0.0000	2.1253
37/2	37/2	2	2	2	0.5367	- 0.0000	- 0.8325	- 0.3865	0.0000	- 0.5477
37/2	37/2	2	2	4	0.0000	0.0000	- 0.6391	- 0.6849	- 0.0000	0.1093
37/2	37/2	2	4	2	- 0.7114	- 0.2934	1.1124	0.4827	- 0.3077	0.6235
37/2	37/2	2	4	4	0.0000	0.0000	0.6034	0.6514	0.1259	- 0.1019
37/2	37/2	4	0	4	0.0000	0.0000	- 0.5317	- 0.5675	0.1567	0.0865
37/2	37/2	4	2	2	- 0.7114	0.2934	1.1124	0.4827	0.3077	0.6235
37/2	37/2	4	2	4	0.0000	0.0000	0.6034	0.6514	- 0.1259	- 0.1019
37/2	37/2	4	4	0	2.9168	0.0000	0.0000	2.7536	0.0000	2.5165
37/2	37/2	4	4	2	0.6932	- 0.0000	- 0.9707	- 0.5082	- 0.0000	- 0.7371
37/2	37/2	4	4	4	0.0000	0.0000	- 0.6326	- 0.6961	0.0000	0.1118

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ I_2 \ I_1) \text{ for } I_1 = 19$$

 L, L'

I_2	I_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
16	19	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5104
16	19	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.2049
16	19	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6589
16	19	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0536
16	19	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0583
16	19	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0612
16	19	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0335
16	19	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.7144
16	19	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0413
16	19	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8623
16	19	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8155
16	19	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0523
17	19	2	0	2	0.0000	0.0000	0.0000	- 0.2932	- 0.5949	0.0905
17	19	2	2	0	0.0000	0.0000	0.0000	2.2165	0.0000	2.1578
17	19	2	2	2	0.0000	0.0000	0.0000	0.3785	0.7104	- 0.0175
17	19	2	2	4	0.0000	0.0000	0.0000	- 0.1128	0.5295	- 0.1271
17	19	2	4	2	0.0000	0.0000	0.0000	- 0.6079	- 0.9251	- 0.3442
17	19	2	4	4	0.0000	0.0000	0.0000	0.1288	- 0.5701	0.1235
17	19	4	0	4	0.0000	0.0000	0.0000	- 0.0715	0.3628	- 0.0997
17	19	4	2	2	0.0000	0.0000	0.0000	- 0.4154	- 0.9272	0.3186
17	19	4	2	4	0.0000	0.0000	0.0000	0.0800	- 0.4365	0.1164
17	19	4	4	0	0.0000	0.0000	0.0000	2.9127	0.0000	2.6557
17	19	4	4	2	0.0000	0.0000	0.0000	0.4742	0.8901	- 0.0732
17	19	4	4	4	0.0000	0.0000	0.0000	- 0.1116	0.5237	- 0.1290
18	19	2	0	2	0.2062	- 0.8417	0.6160	0.1964	- 0.3143	0.3903
18	19	2	2	0	2.2268	0.0000	0.0000	2.1897	0.0000	2.1344
18	19	2	2	2	- 0.2661	1.0322	- 0.6812	- 0.1964	0.4466	- 0.4157
18	19	2	2	4	0.0000	0.0000	0.3903	0.4553	- 0.8444	0.0188
18	19	2	4	2	0.4275	- 1.4544	0.8034	0.1018	- 0.7869	0.2466
18	19	2	4	4	0.0000	0.0000	- 0.4033	- 0.4745	0.7827	0.0046
18	19	4	0	4	0.0000	0.0000	0.2848	0.3309	- 0.7106	0.0422
18	19	4	2	2	0.2954	- 1.2861	1.0321	0.3821	- 0.3502	0.6931
18	19	4	2	4	0.0000	0.0000	- 0.3355	- 0.3939	0.8112	- 0.0401
18	19	4	4	0	2.9584	0.0000	0.0000	2.7941	0.0000	2.5553
18	19	4	4	2	- 0.3371	1.3076	- 0.7984	- 0.2676	0.5518	- 0.5738
18	19	4	4	4	0.0000	0.0000	0.3839	0.4597	- 0.8525	0.0207
19	19	2	0	2	- 0.4468	0.0769	0.7152	0.3166	0.0821	0.4379
19	19	2	2	0	2.2184	0.0000	0.0000	2.1832	0.0000	2.1308
19	19	2	2	2	0.5366	- 0.0000	- 0.8338	0.3863	- 0.0000	- 0.5470
19	19	2	2	4	0.0000	0.0000	- 0.6391	- 0.6848	0.0000	0.1092
19	19	2	4	2	- 0.7117	- 0.2860	1.1143	0.4842	- 0.3002	0.6282
19	19	2	4	4	0.0000	0.0000	0.6037	0.6514	0.1226	- 0.1019
19	19	4	0	4	0.0000	0.0000	- 0.5319	- 0.5677	0.1527	0.0867
19	19	4	2	2	- 0.7117	0.2860	1.1143	0.4842	0.3002	0.6282
19	19	4	2	4	0.0000	0.0000	0.6037	0.6514	- 0.1226	- 0.1019
19	19	4	4	0	2.9211	0.0000	0.0000	2.7660	0.0000	2.5403
19	19	4	4	2	0.6928	- 0.0000	- 0.9770	- 0.5072	- 0.0000	- 0.7346
19	19	4	4	4	0.0000	0.0000	- 0.6332	- 0.6958	- 0.0000	0.1117

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 39/2$$

 L, L'

l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
33/2	39/2	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5118
33/2	39/2	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.2066
33/2	39/2	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6593
33/2	39/2	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0536
33/2	39/2	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0543
33/2	39/2	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0609
33/2	39/2	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0338
33/2	39/2	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.7194
33/2	39/2	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0416
33/2	39/2	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8696
33/2	39/2	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8175
33/2	39/2	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0525
35/2	39/2	2	0	2	0.0000	0.0000	0.0000	- 0.2939	- 0.5951	0.0882
35/2	39/2	2	2	0	0.0000	0.0000	0.0000	2.2175	0.0000	2.1618
35/2	39/2	2	2	2	0.0000	0.0000	0.0000	0.3786	0.7106	- 0.0166
35/2	39/2	2	2	4	0.0000	0.0000	0.0000	- 0.1129	0.5296	- 0.1271
35/2	39/2	2	4	2	0.0000	0.0000	0.0000	- 0.6054	- 0.9269	- 0.3352
35/2	39/2	2	4	4	0.0000	0.0000	0.0000	0.1283	- 0.5686	0.1235
35/2	39/2	4	0	4	0.0000	0.0000	0.0000	- 0.0721	0.3649	- 0.0999
35/2	39/2	4	2	2	0.0000	0.0000	0.0000	- 0.4179	- 0.9288	0.3109
35/2	39/2	4	2	4	0.0000	0.0000	0.0000	0.0886	- 0.4384	0.1166
35/2	39/2	4	4	0	0.0000	0.0000	0.0000	2.9172	0.0000	2.6733
35/2	39/2	4	4	2	0.0000	0.0000	0.0000	0.4749	0.8913	- 0.0695
35/2	39/2	4	4	4	0.0000	0.0000	0.0000	- 0.1118	0.5244	- 0.1289
37/2	39/2	2	0	2	0.2066	- 0.8424	0.6152	0.1955	- 0.3161	0.3890
37/2	39/2	2	2	0	2.2272	0.0000	0.0000	2.1920	0.0000	2.1395
37/2	39/2	2	2	2	- 0.2662	1.0324	- 0.6821	- 0.1962	0.4468	- 0.4150
37/2	39/2	2	2	4	0.0000	0.0000	0.3903	0.4553	- 0.8443	0.0188
37/2	39/2	2	4	2	0.4257	- 1.4532	0.8074	0.1060	- 0.7834	0.2553
37/2	39/2	2	4	4	0.0000	0.0000	- 0.4026	- 0.4734	0.7833	0.0041
37/2	39/2	4	0	4	0.0000	0.0000	0.2859	0.3322	- 0.7107	0.0415
37/2	39/2	4	2	2	0.2969	- 1.2892	1.0303	0.3793	- 0.3574	0.6912
37/2	39/2	4	2	4	0.0000	0.0000	- 0.3365	- 0.3949	0.8111	- 0.0395
37/2	39/2	4	4	0	2.9605	0.0000	0.0000	2.8044	0.0000	2.5772
37/2	39/2	4	4	2	- 0.3374	1.3084	- 0.8033	- 0.2664	0.5531	- 0.5708
37/2	39/2	4	4	4	0.0000	0.0000	0.3845	0.4597	- 0.8524	0.0206
39/2	39/2	2	0	2	- 0.4468	0.0750	0.7153	0.3167	0.0801	0.4384
39/2	39/2	2	2	0	2.2193	0.0000	0.0000	2.1859	0.0000	2.1360
39/2	39/2	2	2	2	0.5365	- 0.0000	- 0.8349	- 0.3861	0.0000	- 0.5464
39/2	39/2	2	2	4	0.0000	0.0000	- 0.6391	- 0.6847	- 0.0000	0.1092
39/2	39/2	2	4	2	- 0.7120	- 0.2790	1.1160	0.4856	- 0.2931	0.6325
39/2	39/2	2	4	4	0.0000	0.0000	0.6040	0.6514	0.1196	- 0.1020
39/2	39/2	4	0	4	0.0000	0.0000	- 0.5320	- 0.5679	0.1489	0.0869
39/2	39/2	4	2	2	- 0.7120	0.2790	1.1160	0.4856	0.2931	0.6325
39/2	39/2	4	2	4	0.0000	0.0000	0.6040	0.6514	- 0.1196	- 0.1020
39/2	39/2	4	4	0	2.9250	0.0000	0.0000	2.7774	0.0000	2.5623
39/2	39/2	4	4	2	0.6923	- 0.0000	- 0.9829	- 0.5063	0.0000	- 0.7322
39/2	39/2	4	4	4	0.0000	0.0000	- 0.6338	- 0.6955	- 0.0000	0.1116

$$F_{\lambda}^{\lambda_2 \lambda_1} (L \ L' \ l_2 \ l_1) \text{ for } l_1 = 20$$

L,L'

l_2	l_1	λ_2	λ_1	λ	1,1	1,2	1,3	2,2	2,3	3,3
17	20	2	0	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.5131
17	20	2	2	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.2081
17	20	2	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.6598
17	20	2	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0536
17	20	2	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 1.0505
17	20	2	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0607
17	20	4	0	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0341
17	20	4	2	2	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.7242
17	20	4	2	4	0.0000	0.0000	0.0000	0.0000	0.0000	- 0.0419
17	20	4	4	0	0.0000	0.0000	0.0000	0.0000	0.0000	2.8763
17	20	4	4	2	0.0000	0.0000	0.0000	0.0000	0.0000	0.8195
17	20	4	4	4	0.0000	0.0000	0.0000	0.0000	0.0000	0.0526
18	20	2	0	2	0.0000	0.0000	0.0000	- 0.2945	- 0.5952	0.0859
18	20	2	2	0	0.0000	0.0000	0.0000	2.2184	0.0000	2.1656
18	20	2	2	2	0.0000	0.0000	0.0000	0.3788	0.7108	- 0.0158
18	20	2	2	4	0.0000	0.0000	0.0000	- 0.1129	0.5298	- 0.1270
18	20	2	4	2	0.0000	0.0000	0.0000	- 0.6031	- 0.9285	- 0.3267
18	20	2	4	4	0.0000	0.0000	0.0000	0.1278	- 0.5671	0.1234
18	20	4	0	4	0.0000	0.0000	0.0000	- 0.0726	0.3669	- 0.1001
18	20	4	2	2	0.0000	0.0000	0.0000	- 0.4203	- 0.9303	0.3036
18	20	4	2	4	0.0000	0.0000	0.0000	0.0891	- 0.4403	0.1167
18	20	4	4	0	0.0000	0.0000	0.0000	2.9214	0.0000	2.6896
18	20	4	4	2	0.0000	0.0000	0.0000	0.4756	0.8924	- 0.0661
18	20	4	4	4	0.0000	0.0000	0.0000	- 0.1119	0.5251	- 0.1289
19	20	2	0	2	0.2070	- 0.8430	0.6145	0.1946	- 0.3177	0.3879
19	20	2	2	0	2.2277	0.0000	0.0000	2.1942	0.0000	2.1442
19	20	2	2	2	- 0.2663	1.0325	- 0.6830	- 0.1959	0.4471	- 0.4143
19	20	2	2	4	0.0000	0.0000	0.3904	0.4553	- 0.8442	0.0187
19	20	2	4	2	0.4239	- 1.4521	0.8111	0.1100	- 0.7801	0.2636
19	20	2	4	4	0.0000	0.0000	- 0.4020	- 0.4724	0.7839	0.0036
19	20	4	0	4	0.0000	0.0000	0.2869	0.3334	- 0.7108	0.0409
19	20	4	2	2	0.2984	- 1.2920	1.0285	0.3766	- 0.3643	0.6892
19	20	4	2	4	0.0000	0.0000	- 0.3375	- 0.3959	0.8110	- 0.0390
19	20	4	4	0	2.9625	0.0000	0.0000	2.8140	0.0000	2.5975
19	20	4	4	2	- 0.3376	1.3092	- 0.8078	- 0.2653	0.5543	- 0.5681
19	20	4	4	4	0.0000	0.0000	0.3850	0.4597	- 0.8523	0.0204
20	20	2	0	2	- 0.4468	0.0732	0.7154	0.3169	0.0781	0.4388
20	20	2	2	0	2.2201	0.0000	0.0000	2.1883	0.0000	2.1408
20	20	2	2	2	0.5364	- 0.0000	- 0.8360	- 0.3859	0.0000	- 0.5458
20	20	2	2	4	0.0000	0.0000	- 0.6391	- 0.5846	- 0.0000	0.1092
20	20	2	4	2	- 0.7122	- 0.2722	1.1177	0.4869	- 0.2862	0.6365
20	20	2	4	4	0.0000	0.0000	0.6043	0.6514	0.1166	- 0.1021
20	20	4	0	4	0.0000	0.0000	- 0.5321	- 0.5680	0.1453	0.0871
20	20	4	2	2	- 0.7122	0.2722	1.1177	0.4869	0.2862	0.6365
20	20	4	2	4	0.0000	0.0000	0.6043	0.6514	- 0.1166	- 0.1021
20	20	4	4	0	2.9286	0.0000	0.0000	2.7880	0.0000	2.5829
20	20	4	4	2	0.6919	- 0.0000	- 0.9883	- 0.5055	0.0000	- 0.7300
20	20	4	4	4	0.0000	0.0000	- 0.6344	- 0.6552	- 0.0000	0.1115

APPENDIX D

TABLE OF EXPANSION COEFFICIENTS $a_{\Lambda}(\lambda, q)$

λ	q	$a_0(\lambda, q)$	$a_2(\lambda, q)$	$a_4(\lambda, q)$
0	0	1	0	0
2	0	0	1	0
2	2	2	-2	0
4	0	0	0	1
4	2	2	10	-12
4	4	56	-80	+24

APPENDIX E

TABLES OF GEOMETRICAL COEFFICIENTS $g_{\Lambda}^{\lambda_1 \lambda \lambda_2}$

$$g_{\Lambda}^{\lambda_1 \lambda \lambda_2} (\theta_1 = \pm \frac{\pi}{2}, \phi = 0)$$

(Geometry N1)

λ_1	λ	λ_2	$g_0^{\lambda_1 \lambda \lambda_2}$	$g_2^{\lambda_1 \lambda \lambda_2}$	$g_4^{\lambda_1 \lambda \lambda_2}$
0	0	0	1.0000	0.0000	0.0000
0	2	2	0.5000	-1.0000	0.0000
0	4	4	0.2083	-0.8333	1.0000
2	0	2	0.0000	0.4472	0.0000
2	2	0	-0.5000	0.0000	0.0000
2	2	2	0.2673	-0.0000	0.0000
2	2	4	0.0445	0.2227	-0.5345
2	4	2	-0.1494	0.4183	0.0000
2	4	4	0.2251	-0.2124	-0.2039
4	0	4	0.0000	0.0000	0.3333
4	2	2	0.0445	-0.3118	0.0000
4	2	4	0.0570	0.2849	-0.1519
4	4	0	0.3750	0.0000	0.0000
4	4	2	-0.1911	0.0000	0.0000
4	4	4	0.1117	-0.0279	0.0670

$$g_{\Lambda}^{\lambda_1 \lambda \lambda_2} (\theta_2 = \pm \frac{\pi}{2}, \phi = 0)$$

(Geometry N2)

λ_1	λ	λ_2	$g_0^{\lambda_1 \lambda \lambda_2}$	$g_2^{\lambda_1 \lambda \lambda_2}$	$g_4^{\lambda_1 \lambda \lambda_2}$
0	0	0	1.0000	0.0000	0.0000
0	2	2	0.5000	-1.0000	0.0000
0	4	4	0.2083	-0.8333	1.0000
2	0	2	-0.2236	0.0000	0.0000
2	2	0	0.0000	1.0000	0.0000
2	2	2	0.2673	-0.0000	0.0000
2	2	4	-0.1114	0.3118	0.0000
2	4	2	0.0598	0.2988	-0.7171
2	4	4	0.2251	-0.2124	-0.2039
4	0	4	0.1250	0.0000	0.0000
4	2	2	0.0445	-0.3118	0.0000
4	2	4	-0.1425	0.0000	0.0000
4	4	0	0.0000	0.0000	1.0000
4	4	2	0.0764	0.3822	-0.2039
4	4	4	0.1117	-0.0279	0.0670

$$g_{\Lambda}^{\lambda_1 \lambda \lambda_2} (\theta_1 = \pm \frac{\pi}{2}, \phi = \pm \frac{\pi}{2})$$

(Geometry Nφ1)

λ_1	λ	λ_2	$g_0^{\lambda_1 \lambda \lambda_2}$	$g_2^{\lambda_1 \lambda \lambda_2}$	$g_4^{\lambda_1 \lambda \lambda_2}$
0	0	0	1.0000	0.0000	0.0000
0	2	2	-0.5000	-0.0000	0.0000
0	4	4	0.3750	0.0000	-0.0000
2	0	2	0.0000	0.4472	0.0000
2	2	0	-0.5000	0.0000	0.0000
2	2	2	-0.2673	0.5345	0.0000
2	2	4	-0.0445	-0.2227	-0.0000
2	4	2	0.1494	0.1195	0.0000
2	4	4	0.1911	-0.3822	-0.0000
4	0	4	0.0000	0.0000	0.3333
4	2	2	-0.0445	-0.2227	0.0000
4	2	4	-0.0570	-0.2849	0.5318
4	4	0	0.3750	0.0000	0.0000
4	4	2	0.1911	-0.3822	0.0000
4	4	4	0.0708	-0.2328	0.3129

$$g_{\Lambda}^{\lambda_1 \lambda \lambda_2} (\theta_2 = \pm \frac{\pi}{2}, \phi = \pm \frac{\pi}{2})$$

(Geometry Nφ2)

λ_1	λ	λ_2	$g_0^{\lambda_1 \lambda \lambda_2}$	$g_2^{\lambda_1 \lambda \lambda_2}$	$g_4^{\lambda_1 \lambda \lambda_2}$
0	0	0	1.0000	0.0000	0.0000
0	2	2	-0.5000	-0.0000	0.0000
0	4	4	0.3750	0.0000	-0.0000
2	0	2	-0.2236	0.0000	0.0000
2	2	0	0.0000	1.0000	0.0000
2	2	2	-0.2673	0.5345	0.0000
2	2	4	0.1114	0.0891	0.0000
2	4	2	-0.0598	-0.2988	-0.0000
2	4	4	0.1911	-0.3822	-0.0000
4	0	4	0.1250	0.0000	0.0000
4	2	2	-0.0445	-0.2227	0.0000
4	2	4	0.1425	-0.2849	0.0000
4	4	0	0.0000	0.0000	1.0000
4	4	2	-0.0764	-0.3822	0.7135
4	4	4	0.0708	-0.2328	0.3129

APPENDIX F

FIGURES

Fig. F-1.

Examples of important geometries in DCO measurements:

- P1 geometry* -- observation of $W(\theta_2; \theta_1 = 0)$;
- N1 geometry* -- observation of $W(\theta_2; \theta_1 = \pm \pi/2, \Phi = \text{fixed})$;
- N Φ 1 geometry* -- observation of $W(\theta_2; \Phi = \pm \pi/2, \theta_1 = \text{fixed})$;
- N1 N2 geometry* -- observation of $W(\Phi; \theta_1 = \pm \pi/2, \theta_2 = \pm \pi/2)$;
- UP1 geometry* -- observation of $W(\theta_2; \Phi = 0, \pi, \theta_1 = \text{fixed})$.

Fig. F-2.

DCO distribution coefficients $\Gamma_2(\delta_1)$ and $\Xi_2(\delta_1)$ for the N1 ($\Phi = 0$), N2 ($\Phi = 0$), P1, and P2 geometries computed for a $2\delta_1 \rightarrow 2 \rightarrow 0$ cascade with orientation parameters $B_2(2') = -0.40$ and $B_4(2') = 0.02$.

Fig. F-3.

Distribution coefficients $\Gamma_4(\delta_1)$ and $\Xi_4(\delta_1)$ for the N1($\Phi = 0$), N2($\Phi = 0$), P1, and P2 geometries computed for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade with orientation parameters $B_2(2') = -0.40$ and $B_4(2') = 0.02$.

Fig. F-4.

Directional distribution coefficients $A_{\lambda\lambda} = B_\lambda(2') A_\lambda(\delta_1)$ for a $2' \rightarrow 2$ transition as a function of δ_1 with orientation parameters of the $2'$ state $B_2(2') = -0.40$ and $B_4(2') = 0.02$ (solid curve), and $B_2(2') = -1.17$ and $B_4(2') = 1.47$ (dotted curve).

Fig. F-5.
DCO directional distribution coefficients $\Xi_\Lambda(\delta_1\delta_2)$ and $\Gamma_\Lambda(\delta_1\delta_2)$ for a $11/2 \rightarrow 9/2 \rightarrow 7/2$ cascade observed in the P1 and N1 geometries. The orientation parameters of the 11/2 state are $B_2(11/2) = -0.092$ and $B_4(11/2) = 0$. The coefficients $\Gamma_4(\delta_1\delta_2)$ and $\Xi_4(\delta_1\delta_2)$ are small and insensitive to δ_1 and δ_2 , $|\Gamma_4(\delta_1\delta_2)| < 0.1$, $|\Xi_4(\delta_1\delta_2)| < 0.1$.

Fig. F-6.

DCO functions $W(\theta_2, \Phi = \pi, \theta_1 = \text{fixed})$ for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade with $\delta_1 = 1$ in the UP1 geometry for various values of θ_1 .

Fig. F-7.

DCO functions $W(\theta_1; \Phi = \pi, \theta_2 = \text{fixed})$ for a $2'_{\delta_1} \rightarrow 2 \rightarrow 0$ cascade with $\delta_1 = 1$ in the UP2 geometry for various values of θ_2 .

Fig. F-8.

Ratio $R(\beta)$ of the DCO functions $W(\theta_1 = \alpha, \theta_2 = \beta, \Phi = \pi)$ and its reverse $W(\theta_1 = \beta, \theta_2 = \alpha, \Phi = \pi)$ for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade with $\delta_1 = 1$ for various angles α in the UP geometry.

Fig. F-9.

Ratio $R(\delta_1)$ of the DCO functions $W(\delta_1; \theta_1 = \pi/2, \theta_2 = 0, \Phi = \pi)$ and its reverse $W(\delta_1; \theta_1 = 0, \theta_2 = \pi/2, \Phi = \pi)$ for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade as a function of the mixing ratio δ_1 .

Fig. F-10.

Ratio $R(\delta_1)$ of the DCO functions $W(\delta_1; \theta_1 = 72^\circ, \theta_2 = -36^\circ, \Phi = \pi)$ and its reverse $W(\delta_1; \theta_1 = -36^\circ, \theta_2 = 72^\circ, \Phi = \pi)$ for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade as a function of the mixing ratio δ_1 .

Fig. F-11.

DCO distribution coefficients Γ_Λ of a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade for $\delta_1 = 1$ for the N1($\Phi = 0$), N2($\Phi = 0$), N Φ 1, and N Φ 2 geometries as a function of the angle Φ (for N1, N2) and as a function of θ (for N Φ 1, N Φ 2), respectively. Orientation parameters of the $2'$ state are $B_2(2') = -0.40$ and $B_4(2') = 0.02$.

Fig. F-12.

DCO distribution coefficients $\Gamma_2(\delta_1)$ and $\Xi_2(\delta_1)$ for the N1($\Phi=0$), N2($\Phi=0$), P1, and P2 geometries computed for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade with orientation parameters $B_2(2') = -1.17$ and $B_4(2') = 1.47$.

Fig. F-13.

Distribution coefficients $\Gamma_4(\delta_1)$ and $\Xi_4(\delta_1)$ for the N1($\Phi = 0$), N2($\Phi = 0$), P1, and P2 geometries computed for a $2' \rightarrow 2 \rightarrow 0$ cascade with orientation parameters $B_2(2') = -1.17$ and $B_4(2') = 1.47$.

Fig. F-14.

Ratio $R(\alpha)$ of the DCC functions $W(\theta_1 = \alpha, \theta_2 = \beta, \Phi = \pi)$ and its reverse $W(\theta_1 = \beta, \theta_2 = \alpha, \Phi = \pi)$ for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade with $\delta_1 = 1$ for various angles β in the UP geometry. $B_2(2') = -1.17$ and $B_4(2') = 1.47$.

Fig. F-15.

Ratio $R(\delta_1)$ of the DCO functions $W(\delta_1; \theta_1 = \pi/2, \theta_2 = 0, \Phi = \pi)$ and its reverse $W(\delta_1; \theta_1 = 0, \theta_2 = \pi/2, \Phi = \pi)$ for a $2, \delta_1 \rightarrow 2 \rightarrow 0$ cascade as a function of the mixing ratio δ_1

Fig. F-16.

Ratio $R(\delta_1)$ of the DCO functions $W(\delta_1; \theta_1 = 72^\circ, \theta_2 = -36^\circ, \Phi = \pi)$ and its reverse $W(\delta_1; \theta_1 = -36^\circ, \theta_2 = 72^\circ, \Phi = \pi)$ for a $2' \xrightarrow{\delta_1} 2 \rightarrow 0$ cascade as a function of the mixing ratio δ_1 .

Fig. F-17.

The DCO distribution coefficients $\Gamma_2(\delta_1, \bar{\delta}_1)$ of a $2' \rightarrow 2 \rightarrow 0$ cascade for the N1 and N2 geometries as a function of the multipole mixing parameters $\delta_1 = \langle M2 \rangle / \langle E1 \rangle > 0$ and $\bar{\delta}_1 = \langle E3 \rangle / \langle E1 \rangle > 0$. The orientation parameters of the initial oriented state are $B_2(2') = 0.80$ and $B_4(2') = 0.10$.

Fig. F-18.

The DCO distribution coefficients $\Gamma_2(\delta_1, \bar{\delta}_1)$ of a $2' \xrightarrow{\delta_1, \bar{\delta}_1} 2 \rightarrow 0$ cascade for the N1 and N2 geometries as a function of the multipole mixing parameters $\delta_1 = \langle M2 \rangle / \langle E1 \rangle > 0$ and $\bar{\delta}_1 = \langle E3 \rangle / \langle E1 \rangle < 0$. The orientation parameters of the initial oriented state are $B_2(2') = 0.80$ and $B_4(2') = 0.10$.

Fig. F-19.

The DCO distribution coefficients $\Gamma_2(\delta_1, \bar{\delta}_1)$ of a $2' \xrightarrow{\delta_1, \bar{\delta}_1} 2 \rightarrow 0$ cascade for the N1 and N2 geometries as a function of the multipole mixing parameters $\delta_1 = \langle M2 \rangle / \langle E1 \rangle < 0$ and $\bar{\delta}_1 = \langle E3 \rangle / \langle E1 \rangle > 0$. The orientation parameters of the initial oriented state are $B_2(2') = 0.80$ and $B_4(2') = 0.10$.

Fig. F-20.

The DCO distribution coefficients $\Gamma_2(\delta_1, \bar{\delta}_1)$ of a $2' \xrightarrow{\delta_1, \bar{\delta}_1} 2 \rightarrow 0$ cascade for the N1 and N2 geometries as a function of the multipole mixing parameters $\delta_1 = \langle M2 \rangle / \langle E1 \rangle < 0$ and $\bar{\delta}_1 = \langle E3 \rangle / \langle E1 \rangle < 0$. The orientation parameters of the initial oriented state are $B_2(2') = 0.80$ and $B_4(2') = 0.10$.