COMPILATION OF HIGH-ENERGY-PHYSICS REACTION DATA:
INVENTORY OF THE PARTICLE DATA GROUP HOLDINGS 1980

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PART I
DESCRIPTIVE TEXT

A. INTRODUCTION

The Berkeley Particle Data Group (BPDG) began publishing compilations of reaction (scattering) data in 1969. In the ensuing years, several groups, including the BPDG, have published a considerable number of reaction-data compilations. These compilations, however, have generally not been able to keep up with the explosive growth in volume and variety of reaction data.

In 1971, in an attempt to consolidate and standardize the results of many compilations and make it more likely that such efforts would continue, the BPDG began studying how to organize all reaction data in a comprehensive manner. In the years since then, an expanded version of the Particle Data Group (including contingents from Cal-Tech and the United Kingdom) has designed and implemented, and is now utilizing on a limited basis, a unified system of encoding procedures and computer programs capable of handling most reaction data and related bibliographical information. Key elements of this system are a series of interrelated databases, powerful and flexible encoding languages,¹ a single generalized database management system for handling the data in all databases (the Berkeley Database Management System, BDMS²), and a system of specialized programs interfacing to BDMS which service users' needs such as graphics, fitting, generating special format reports, etc.

There are three main databases: The Document File contains bibliographic information and experiment descriptions for all experimental papers issued since 1969, and for some earlier papers (about 20,000 documents in all). The contents of this file, as of mid-1978, were published as LBL-90.³ The Proposal File contains descriptions of all current, approved experiment proposals. Its contents were last published in mid-1980 as LBL-91 Revised.⁴ The third file is the Reaction-Data File described in this report. While we plan to publish the contents of each database only periodically, we hope eventually to keep the databases themselves up-to-date on a steady-state basis.

This report contains Indices to and Listings of all reaction data so far entered into the Reaction-Data File. This compilation is, unfortunately, not complete or current in all areas, and has not been thoroughly checked. Nevertheless, it is by far the largest compilation of reaction data so far published; it contains in one place, in one uniform

presentation, data previously available only from different sources in differing formats. In a few areas, it contains new data, never before published. The main purpose of this report, however, is not the presentation of these data, but the announcement of this new reaction-data compilation effort. The motivation for publishing the reaction compilation in such an incomplete state is to solicit user response to this effort, both to help correct errors and omissions and also to suggest ways in which we can develop this system to be of maximum value to the user community. Even with substantially more manpower, we could not hope to encode the backlog of all old data, establish steady-state encoding of all new data, and provide services which one would hope to have. We expect user response to help guide us in establishing priorities in these areas. Our hope is to make the data in our databases directly and easily accessible to users (by either phone link or tape exchange), providing various support packages (e.g., graphics) to accomplish this goal; such direct access is already possible in a somewhat rudimentary fashion.

B. DATA COVERAGE

1. Existing Compilations

The bulk of the data in the Reaction-Data File was obtained from existing compilations, both of the BPDG and of outside sources. Some of these compilations have appeared in print and some have not. In the Data Listings (on microfiche), most data sets are labeled by the name of the compilation from which the data were obtained. The list of such compilations, and guides thereto, is as follows (the compilation short code, and, where different, the label used on the fiche for the compilation, is given in square brackets):

O. Benary et al., 'A Compilation of YN Reactions,' UCRL-20000 YN (Jan. 1970) [BENARY 70B, referred to on fiche with special code PDG3].

O. Benary et al., 'NN and ND Interactions Above 0.5 GeV/c - A Compilation,' UCRL-20000 NN (Aug. 1970) [BENARY 70, referred to on fiche with special code PDG3].

E. Bracci et al., 'Compilation of Cross Sections. I - π^- and π^+ Induced Reactions,' CERN/HERA 72-1 (May 1972) [BRACCI 72].

E. Bracci et al., 'Compilation of Cross Sections. II -

K^- and K^+ Induced Reactions,' CERN/HERA 72-2 (Oct. 1972) [BRACCI 72B].

E. Bracci et al., 'Compilation of Cross Sections. III - p and $\bar{p}$ Induced Reactions,' CERN/HERA 73-1 (June 1973) [BRACCI 73].

J. Bystricky et al., 'Elastic Nucleon Nucleon Scattering Data 270-3000 MeV,' CEA-N-1547-E (1972) [BYSTRICKY 72].

D. M. Chew et al., ' π^+p , π^+n , and π^+d Interactions - A Compilation,' LBL-53 (May 1973) [CHEW 73B].

R. L. Crawford, unpublished $\bar{Y}N$ data compilation [referred to on fiche as CRAWFORD 77, although never published; superseded by Glasgow photoproduction compilation (see 'New Compilations' section immediately below)].

J. E. Enstrom et al., ' $\bar{N}N$ and $\bar{N}D$ Interactions - A Compilation,' LBL-58 (May 1972) [ENSTROM 72, referred to on fiche with special code PDG3].

G. C. Fox et al., 'Compilation of Elastic Data,' UCRL-20001 (Jan. 1970), and unpublished data compilation [referred to on fiche with special codes FOX1, FOX2, FOX5-FOX8, AND LST1-LST7].

G. Giacomelli, 'A Compilation of Pion-Nucleon Scattering Data,' CERN/HERA 69-1 (1969) [GIACOMELLI 69, referred to on fiche with special codes FOX3 and FOX4].

M. L. Gupta et al., 'A Computerized Compilation of K^-N Scattering Data for Two Body Final States up to 3.0 GeV/C,' VPUKNA-2-70 (1970) [GUPTA 70].

J. Kasman, unpublished inclusive data compilation.

R. L. Kelly, unpublished πN data compilation.

C. Lovelace et al., ' πN Two-Body Scattering Data: I. A User's Guide to the Lovelace-Almeida Data Tape,' LBL-63 (Apr. 1973), and unpublished data compilation [LOVELACE 73, incorrectly referred to on fiche as LOVELACE 71].

M. H. MacGregor et al., '(p,p) and (n,p) Data Listings 0 to 750 MeV,' UCRL-50426 (1968) [MACGREGOR 68].

L. R. Price et al., 'A Compilation of K^+N Reactions,' UCRL-20000 K^+N (Sept. 1969) [PRICE 69, referred to on fiche with special code PDG3].

J. L. Schonfelder, 'A Data-handling System for $\bar{K}N$ Scattering Data,' Univ. of Birmingham, England preprint (1972) [referred to on fiche as SCHONFELDER 70?].

F. Uchiyama et al., ' K^0_N Interactions - A Compilation,' LBL-55 (Mar. 1972) [UCHIYAMA 72].

F. Wagner, unpublished data compilation [referred to on fiche as WAGNER 71B, although never published].

Each of these compilations has different standards and different coverage as to data types and period of time. No effort has yet been made to remove duplication due to the same data appearing in different compilations. Most data have not been checked by us against the original source documents and so should be used with care.

2. New Compilations

Data from five ongoing, steady-state compilations being carried out by the U. K. contingent of the PDG are also included. These are: 1) the Durham 2-body compilation; 2) the Glasgow photoproduction compilation; 3) the Rutherford hadron-induced inclusive compilation; 4) the Rutherford lepton-induced inclusive compilation; and 5) the Durham e^+e^- compilation. While the encoding of data by this group is an ongoing process, so that the Reaction-Data File is always current in these areas, the Listings included here cover only the period up to late 1979.

3. Limitations

Again we repeat that data from the present compilation should be used with great care. The data presented here were not checked systematically against the source documents by us.

In no area is coverage complete and in only a few cases is it up-to-date. For certain classes of data, there is considerable duplication and thus the possibility of inconsistencies exists.

The handling of systematic errors is especially uneven. The five steady-state compilations mentioned above quote them uniformly and unambiguously. Most older compilations do not quote them at all, and some quote them ambiguously. Thus, except in the case of the steady-state compilations, the systematic errors should be checked out against the source document. Another problem is the handling of binned data; for instance, a $d\sigma/dt$ measurement in a t bin between 0 and -0.05 $(\text{GeV}/c)^2$ will in some compilations be recorded as a measurement at $t \approx -0.025$ $(\text{GeV}/c)^2$ without indication of the averaging. Although most data have been recorded in the form in which they were presented in the original papers, some have been converted into a different form, e.g., from $d\sigma/dQ$ to $d\sigma/dt$, before being compiled.

Although the accelerator and detector used by an experiment are sometimes given in comments in this compilation, this information is

spotty; for a more complete specification of such details, see IBL-90.³

C. REQUESTS FOR DATA

Within reason, we will try to answer personal requests for data. Although initially we would expect to send printed listings in response to such requests, as time goes on we want to encourage more and more users to access our databases directly. For physicists in Britain, or at CERN or DESY, this has been possible since 1978, using the U. K. SRC network.⁵ It is hoped that a telephone link will be available soon in the U. S. See the list of contacts below if you are interested in this kind of access.

We also have on hand hard copies of almost all papers for which we have encoded the data. In those cases where the source document is a preprint and is no longer generally available, we may be able to provide a copy upon request. Our limited budget does not allow us to distribute copies of published papers.

We welcome corrections to any of the data in the Listings. We would further like to encourage experimenters to send us data that are too voluminous to publish in journals or preprints.

For any of these matters concerning the Reaction-Data File, please contact one of the following:

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Berkeley, CA 94720, USA
Phone: (415) 486-5885 or FTS on-net 451-5885

D. USERS' GUIDE

The substantive information in this report is organized as follows:
The Data Listings themselves are given only on microfiche, which accompany

this printed report as Part IV. All data from a given document are grouped together on the fiche, and the documents are ordered by their first author and year. Each Data Listing entry has some basic bibliographic information, comments, systematic error information (if encoded), and the actual data. For the most part, the format, notation, and particle, variable, and observable names are self-explanatory. However, for completeness, Vocabularies have been provided in PART III which explain the various names and abbreviations used; also, for those desiring more detailed knowledge of encoding conventions, the entire Reaction-Data File Encoding Manual has been put onto a fiche and is included with this report. Two Indices are provided to cross-reference the Data Listings; these Indices are described and presented in PART II.

E. LOCATING DATA IN THE DATA LISTINGS

The Data Listings, on fiche, are ordered alphabetically by the 'short code' of the document from which the data were extracted. The short code is a unique identifier assigned by us to each document. It is composed of the first author's last name, the year of issue, and a uniqueness letter or letters, if required (e.g., JONES 67). If there is more than one document with the same first author and the same issue date, the second short code would be given the letter B (e.g., JONES 67B). Since a short code must have no more than 16 characters, some long names are truncated. The short code is based on the first version of the document received (often the preprint), so the date of issue may be earlier than the date of journal publication, and in rare cases, the short code may not be based on the first author of the journal publication. All the short codes in this document should be identical to those in LBL-90.³ However, we do have data from papers not yet entered into our LBL-90 database. These documents have a ? as the last character of their short codes. The bibliographical information in each record should be sufficient to locate the source document, whether or not it appeared in LBL-90.

In steady-state, all data from a given document would be encoded in one record in the database and would appear in one unit on the fiche. Here, however, because we have used data from many sources, and for other historical reasons, data from the same paper may be broken up into several units; however, these units will be contiguous on the fiche.

Two Indices have been provided to help locate data of interest:

The Short-Code/Reference Index: This Index lists the short codes and references of all documents represented in the compilation. Thus, if the first author of a document were known, either a priori or by use of the Reaction/Momentum Index described below, then this Index would be used to determine the journal or preprint reference, so that the actual paper could be located. The reference information may also be used to distinguish between different papers by the same author in the same year.

The Reaction/Momentum Index: This Index lists all reactions (and their momenta) for which data have been encoded. Thus, if data on a given reaction were desired, this Index would be used. For each reaction, every momentum at which data have been encoded is listed, and, for each reaction/momentum pair, the short codes for papers containing the relevant data are given. Beam momenta are always given as equivalent lab momentum (in GeV/c) for a stationary target, except for e^+e^- collisions, where the total center-of-mass energy in GeV is given instead. The Index is ordered as follows: in each reaction, the beam and target are given first, followed by the final state particles in a 'natural' order. Reactions are then ordered lexicographically, i.e., alphabetically by the first particle, or, if that is identical, by the second particle, etc.

The Data Listings and both Indices are preceded by 'Illustrative Keys,' giving details about the format of the presentations.

F. ACKNOWLEDGEMENTS

We would like to thank J. Gee for assisting with much of the data input and output at Cal-Tech; T. A. Lasinski and F. Uchiyama for participating in the early design stages of the Reaction-Data File language; and A. H. Rosenfeld for providing a great deal of inspiration at the beginning of this project.

REFERENCES

1. Particle Data Group, 'Particle Physics Data System Reaction-Data File Encoding Manual,' PDG-3200; Particle Data Group, 'Particle Physics Data System Document File Encoding Manual,' Particle Data Group, PDG-3100.
2. D. R. Richards, 'BDMS User's Manual,' LBL-4683 (Revision 1); D. R. Richards, 'BDMS Programmer's Manual,' LBL-4684.
3. C. P. Horne et al., 'An Indexed Compilation of Experimental High Energy Physics Literature,' LBL-90 (Sept. 1978).
4. C. G. Wohl et al., 'Compilation of Current High Energy Physics Experiments,' LBL-91 Revised (April 1980).
5. F. D. Gault et al., 'Guide to the Durham-Rutherford High Energy Physics Databases,' Second Edition, RL-79-094 (Dec. 1979).

PART II

INDICES

SHORT-CODE/REFERENCE INDEX

This Index lists the short codes and references of all documents represented in this compilation. Thus, if the first author of a document were known, either a priori or by use of the Reaction/Momentum Index which follows, then this Index would be used to determine the journal or preprint reference, so that the actual paper could be located. The reference information may also be used to distinguish between different papers by the same author in the same year. The primary reference is given first, followed by all secondary (e.g., preprint) references. For more detailed bibliographic information than is given here, please refer to LBL-90, or, for post-1977 articles, contact the Berkeley Particle Data Group.

ILLUSTRATIVE KEY

DOCUMENT SHORT CODE THE DATA FROM THIS DOCUMENT CAN BE FOUND IN THE DATA LISTINGS ON MICROFICHE

PRIMARY REFERENCE SEE THE REFERENCE VOCABULARY FOR JOURNAL ABBREVIATIONS

SECONDARY REFERENCE(S) SEE THE REFERENCE VOCABULARY FOR JOURNAL ABBREVIATIONS

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MICROFICHE LOCATION - FICHE NUMBER AND COLUMN WHERE THE DATA LISTINGS FOR THIS DOCUMENT BEGIN. AN ASTERISK MEANS THAT THIS DOCUMENT IS COMBINED WITH AND ALPHABETIZED ACCORDING TO ANOTHER DOCUMENT ON THE FICHE (USUALLY BECAUSE THE TWO DOCUMENTS SHARE SOME DATA)

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VINTM 71 76	PR 131, 313	62:18	1	VODM 85	PR 41, 684	04:12
VINTM 71 77	PR 131, 313	62:18	1	VODM 86	PR 41, 684	04:12
VINTM 71 78	PR 131, 313	62:18	1	VODM 87	PR 41, 684	04:12
VINTM 71 79	PR 131, 313	62:18	1	VODM 88	PR 41, 684	04:12
VINTM 71 80	PR 131, 313	62:18	1	VODM 89	PR 41, 684	04:12
VINTM 71 81	PR 131, 313	62:18	1	VODM 90	PR 41, 684	04:12
VINTM 71 82	PR 131, 313	62:18	1	VODM 91	PR 41, 684	04:12
VINTM 71 83	PR 131, 313	62:18	1	VODM 92	PR 41, 684	04:12
VINTM 71 84	PR 131, 313	62:18	1	VODM 93	PR 41, 684	04:12
VINTM 71 85	PR 131, 313	62:18	1	VODM 94	PR 41, 684	04:12
VINTM 71 86	PR 131, 313	62:18	1	VODM 95	PR 41, 684	04:12
VINTM 71 87	PR 131, 313	62:18	1	VODM 96	PR 41, 684	04:12
VINTM 71 88	PR 131, 313	62:18	1	VODM 97	PR 41, 684	04:12
VINTM 71 89	PR 131, 313	62:18	1	VODM 98	PR 41, 684	04:12
VINTM 71 90	PR 131, 313	62:18	1	VODM 99	PR 41, 684	04:12
VINTM 71 91	PR 131, 313	62:18	1	VODM 100	PR 41, 684	04:12
VINTM 71 92	PR 131, 313	62:18	1	VODM 101	PR 41, 684	04:12
VINTM 71 93	PR 131, 313	62:18	1	VODM 102	PR 41, 684	04:12
VINTM 71 94	PR 131, 313	62:18	1	VODM 103	PR 41, 684	04:12
VINTM 71 95	PR 131, 313	62:18	1	VODM 104	PR 41, 684	04:12
VINTM 71 96	PR 131, 313	62:18	1	VODM 105	PR 41, 684	04:12
VINTM 71 97	PR 131,					

REACTION/MOMENTUM INDEX

This Index lists all reactions for which data have been encoded. Thus, if data on a given reaction were desired, this Index would be used. For each reaction, every momentum at which data have been encoded is listed, and, for each reaction/momentum pair, the short codes for papers containing the relevant data are given. Beam momenta are always given as equivalent lab momentum (in GeV/c) for a stationary target, except for e^+e^- collisions, where the total center-of-mass energy in GeV is given instead.

The Index is ordered as follows: in each reaction, the beam and target are given first, followed by the final state particles in a 'natural' order. Reactions are then ordered lexicographically, i.e., alphabetically by the first particle (the beam), or, if that is identical, by the second particle (the target), etc., through all the final state particles. A list of all reactions appearing in the index is given immediately following this discussion. The reaction numbers appearing in this list can be used to help locate the proper page in the full Index for the desired reaction, via the reaction number range given at the top of each page.

The particle names used in the reactions are given in the Particle Vocabulary in Part III of this report; these are generally the same names as used in the 'Review of Particle Properties.' However, some names, particularly those appearing in topological reactions, are somewhat ambiguous; e.g., the terms 'missing mass' and 'neutrals' are often used interchangeably. Another ambiguity arises in the case of reactions involving a deuteron target; some authors write the reaction as such (with two nucleons, one often a spectator, in the final state), while others write the reaction with a neutron target (and only one nucleon in the final state). Also, a reaction with a nuclear target might be encoded with the specific nucleus, such as BE, or with the generic name NUCLEUS if the exact nucleus is uncertain. For all of these reasons, and more, care should be exercised by the user when looking for a given reaction.

The syntax used for writing reactions is generally straightforward. As an example, the reaction $\pi^- p \rightarrow \pi^- \Delta^+$ would be written as

PI- P --> PI- DEL+ .

In this reaction, since no specific decay mode for the Δ^+ is indicated, it is understood that the measured quantity, e.g. the cross section, is for all decay modes, that is, for all Δ^+ . If the quantity measured applied only to a particular decay mode, $p\pi^0$, say, then the reaction would be written as

That is, angular brackets are used to indicate specific decay modes of the preceding particle. Also, sometimes a compound final state may have been detected; in this case, the two (or more) final states are written separated with a '+' (or '-' in the case of subtraction) surrounded by blanks; e.g.,

ILLUSTRATIVE KEY

INITIAL STATE OF THE REACTION
SEE THE PARTICLE VOCABULARY
FOR NOMENCLATURE

[GAMMA DEUT] -->

-ANYTHING

.265-4.22 ARMSTRONG 72
2.00-4.00 ARMSTRONG 72
2.00-9.51 MICHALOWSKI 77?
3.70-17.8 CALDWELL 73
4.07-16.4 CALDWELL 73
4.30 EISENBERG 76D
7.50 ALEXANDER 74E

DOCUMENT SHORT CODE: THE
REFERENCE FOR THIS DOCUMENT
CAN BE FOUND IN THE SHORT
CODE REFERENCE INDEX; THE
DATA CAN BE FOUND IN THE
DATA LISTINGS ON MICROFICHE

FINAL STATE OF THE REACTION
SEE THE PARTICLE VOCABULARY
FOR NOMENCLATURE

[+AP ANYTHING]

7 BOYARSKI 75R

-DEUT PI+ PI-

3.00 BAPU 77
[4.30] EISENBERG 76D
7.50 ALEXANDER 74E
ALEXANDER 75C

LAB MOMENTUM IN GEV C
'EXCEPT FOR e^+e^- and e^-e^+ '
TOTAL CENTER OF MASS
ENERGY IN GEV

-DEUT 2PI+ 2PI-

7.50 ALEXANDER 74E

[illegible]

REACTION/MOMENTUM INDEX - LIST OF REACTIONS (CONT'D)

[illegible]

[illegible]

REACTION/MOMENTUM INDEX - LIST OF REACTIONS (CONT'D)

[illegible]

[illegible]

[illegible]

REACTION/MOMENTUM INDEX - LIST OF REACTIONS (CONT'D)

[illegible]

REACTION/MOMENTUM INDEX - LIST OF REACTIONS (CONT'D)

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REACTION/MOMENTUM INDEX - LIST OF REACTIONS (CONT'D)

[illegible]

[illegible]

REACTION/MOMENTUM INDEX - LIST OF REACTIONS (CONT'D)

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REACTION/MOMENTUM INDEX (CONT'D)

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REACTIONS 234 TO 350

REACTION/MOMENTUM INDEX (CONT'D)

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REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 534 TO 594

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REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 740-10 757

[illegible]

REACTION/MOMENTUM INDEX (CONT'D)

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REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 900 TO 956

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REACTION/MOMENTUM INDEX (CONT'D)

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REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 1057 TO 1200

REACTION	MOMENTUM	REACTION	MOMENTUM	REACTION	MOMENTUM	REACTION	MOMENTUM
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1065	1065	1066	1066	1067	1067	1068	1068
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1077	1077	1078	1078	1079	1079	1080	1080
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1085	1085	1086	1086	1087	1087	1088	1088
1089	1089	1090	1090	1091	1091	1092	1092
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1097	1097	1098	1098	1099	1099	1100	1100
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1105	1105	1106	1106	1107	1107	1108	1108
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1121	1121	1122	1122	1123	1123	1124	1124
1125	1125	1126	1126	1127	1127	1128	1128
1129	1129	1130	1130	1131	1131	1132	1132
1133	1133	1134	1134	1135	1135	1136	1136
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1141	1141	1142	1142	1143	1143	1144	1144
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1153	1153	1154	1154	1155	1155	1156	1156
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1161	1161	1162	1162	1163	1163	1164	1164
1165	1165	1166	1166	1167	1167	1168	1168
1169	1169	1170	1170	1171	1171	1172	1172
1173	1173	1174	1174	1175	1175	1176	1176
1177	1177	1178	1178	1179	1179	1180	1180
1181	1181	1182	1182	1183	1183	1184	1184
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1189	1189	1190	1190	1191	1191	1192	1192
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REACTIONS: 54, 10, 2, 0, 2

[illegible]

REACTION/MOMENTUM INDEX (CONT'D)

[illegible]

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REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 1838 TO 1904

REACTION	REACTION	REACTION	REACTION
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1866	1867	1868	1869
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1874	1875	1876	1877
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1894	1895	1896	1897
1898	1899	1900	1901
1902	1903	1904	

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2042	2043	2044	2045
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2050	2051	2052	2053
2054	2055	2056	2057
2058	2059	2060	2061
2062	2063	2064	2065
2066	2067	2068	2069
2070	2071	2072	2073
2074	2075	2076	2077
2078	2079	2080	2081
2082	2083	2084	2085
2086	2087	2088	2089
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2094	2095	2096	2097
2098	2099	2100	2101
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2109-7.18	2110-7.18	2111-7.18	2112-7.18
2110-7.18	2111-7.18	2112-7.18	2113-7.18
2111-7.18	2112-7.18	2113-7.18	2114-7.18
2112-7.18	2113-7.18	2114-7.18	2115-7.18
2113-7.18	2114-7.18	2115-7.18	2116-7.18
2114-7.18	2115-7.18	2116-7.18	2117-7.18
2115-7.18	2116-7.18	2117-7.18	2118-7.18
2116-7.18	2117-7.18	2118-7.18	2119-7.18
2117-7.18	2118-7.18	2119-7.18	2120-7.18
2118-7.18	2119-7.18	2120-7.18	2121-7.18
2119-7.18	2120-7.18	2121-7.18	2122-7.18
2120-7.18	2121-7.18	2122-7.18	2123-7.18
2121-7.18	2122-7.18	2123-7.18	2124-7.18
2122-7.18	2123-7.18	2124-7.18	2125-7.18
2123-7.18	2124-7.18	2125-7.18	2126-7.18
2124-7.18	2125-7.18	2126-7.18	2127-7.18
2125-7.18	2126-7.18	2127-7.18	2128-7.18
2126-7.18	2127-7.18	2128-7.18	2129-7.18
2127-7.18	2128-7.18	2129-7.18	2130-7.18
2128-7.18	2129-7.18	2130-7.18	2131-7.18
2129-7.18	2130-7.18	2131-7.18	2132-7.18
2130-7.18	2131-7.18	2132-7.18	2133-7.18
2131-7.18	2132-7.18	2133-7.18	2134-7.18
2132-7.18	2133-7.18	2134-7.18	2135-7.18
2133-7.18	2134-7.18	2135-7.18	2136-7.18
2134-7.18	2135-7.18	2136-7.18	2137-7.18
2135-7.18	2136-7.18	2137-7.18	2138-7.18
2136-7.18	2137-7.18	2138-7.18	2139-7.18
2137-7.18	2138-7.18	2139-7.18	2140-7.18
2138-7.18	2139-7.18	2140-7.18	2141-7.18
2139-7.18	2140-7.18	2141-7.18	2142-7.18
2140-7.18	2141-7.18	2142-7.18	2143-7.18
2141-7.18	2142-7.18	2143-7.18	2144-7.18
2142-7.18	2143-7.18	2144-7.18	2145-7.18
2143-7.18	2144-7.18	2145-7.18	2146-7.18
2144-7.18	2145-7.18	2146-7.18	2147-7.18
2145-7.18	2146-7.18	2147-7.18	2148-7.18
2146-7.18	2147-7.18	2148-7.18	2149-7.18
2147-7.18	2148-7.18	2149-7.18	2150-7.18
2148-7.18	2149-7.18	2150-7.18	2151-7.18
2149-7.18	2150-7.18	2151-7.18	2152-7.18
2150-7.18	2151-7.18	2152-7.18	2153-7.18
2151-7.18	2152-7.18	2153-7.18	2154-7.18
2152-7.18	2153-7.18	2154-7.18	2155-7.18
2153-7.18	2154-7.18	2155-7.18	2156-7.18

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REACTION/MOMENTUM INDEX (CONT'D)

[illegible]

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2795	2806	2817	2828
2796	2807	2818	2829
2797	2808	2819	2830
2798	2809	2820	2831
2799	2810	2821	2832
2800	2811	2822	2833
2801	2812	2823	2834
2802	2813	2824	2835
2803	2814	2825	2836
2804	2815	2826	2837
2805	2816	2827	2838
2806	2817	2828	2839
2807	2818	2829	2840
2808	2819	2830	2841
2809	2820	2831	2842
2810	2821	2832	2843
2811	2822	2833	2844
2812	2823	2834	2845
2813	2824	2835	2846
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2815	2826	2837	2848
2816	2827	2838	2849
2817	2828	2839	2850
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1.24	CARTER 68	1.11-1.84	CITRON 66
1.25	BAKER 67	1.11-1.84	CITRON 66
1.26	BAKER 67	1.11-1.84	CITRON 66
1.27	BAKER 67	1.11-1.84	CITRON 66
1.28	BAKER 67	1.11-1.84	CITRON 66
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1.30	BAKER 67	1.11-1.84	CITRON 66
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1.32	BAKER 67	1.11-1.84	CITRON 66
1.33	BAKER 67	1.11-1.84	CITRON 66
1.34	BAKER 67	1.11-1.84	CITRON 66
1.35	BAKER 67	1.11-1.84	CITRON 66
1.36	BAKER 67	1.11-1.84	CITRON 66
1.37	BAKER 67	1.11-1.84	CITRON 66
1.38	BAKER 67	1.11-1.84	CITRON 66
1.39	BAKER 67	1.11-1.84	CITRON 66
1.40	BAKER 67	1.11-1.84	CITRON 66
1.41	BAKER 67	1.11-1.84	CITRON 66
1.42	BAKER 67	1.11-1.84	CITRON 66
1.43	BAKER 67	1.11-1.84	CITRON 66
1.44	BAKER 67	1.11-1.84	CITRON 66
1.45	BAKER 67	1.11-1.84	CITRON 66
1.46	BAKER 67	1.11-1.84	CITRON 66
1.47	BAKER 67	1.11-1.84	CITRON 66
1.48	BAKER 67	1.11-1.84	CITRON 66
1.49	BAKER 67	1.11-1.84	CITRON 66
1.50	BAKER 67	1.11-1.84	CITRON 66
1.51	BAKER 67	1.11-1.84	CITRON 66
1.52	BAKER 67	1.11-1.84	CITRON 66
1.53	BAKER 67	1.11-1.84	CITRON 66
1.54	BAKER 67	1.11-1.84	CITRON 66
1.55	BAKER 67	1.11-1.84	CITRON 66
1.56	BAKER 67	1.11-1.84	CITRON 66
1.57	BAKER 67	1.11-1.84	CITRON 66
1.58	BAKER 67	1.11-1.84	CITRON 66
1.59	BAKER 67	1.11-1.84	CITRON 66
1.60	BAKER 67	1.11-1.84	CITRON 66
1.61	BAKER 67	1.11-1.84	CITRON 66
1.62	BAKER 67	1.11-1.84	CITRON 66
1.63	BAKER 67	1.11-1.84	CITRON 66
1.64	BAKER 67	1.11-1.84	CITRON 66
1.65	BAKER 67	1.11-1.84	CITRON 66
1.66	BAKER 67	1.11-1.84	CITRON 66
1.67	BAKER 67	1.11-1.84	CITRON 66
1.68	BAKER 67	1.11-1.84	CITRON 66
1.69	BAKER 67	1.11-1.84	CITRON 66
1.70	BAKER 67	1.11-1.84	CITRON 66
1.71	BAKER 67	1.11-1.84	CITRON 66
1.72	BAKER 67	1.11-1.84	CITRON 66
1.73	BAKER 67	1.11-1.84	CITRON 66
1.74	BAKER 67	1.11-1.84	CITRON 66
1.75	BAKER 67	1.11-1.84	CITRON 66
1.76	BAKER 67	1.11-1.84	CITRON 66
1.77	BAKER 67	1.11-1.84	CITRON 66
1.78	BAKER 67	1.11-1.84	CITRON 66
1.79	BAKER 67	1.11-1.84	CITRON 66
1.80	BAKER 67	1.11-1.84	CITRON 66
1.81	BAKER 67	1.11-1.84	CITRON 66
1.82	BAKER 67	1.11-1.84	CITRON 66
1.83	BAKER 67	1.11-1.84	CITRON 66
1.84	BAKER 67	1.11-1.84	CITRON 66
1.85	BAKER 67	1.11-1.84	CITRON 66
1.86	BAKER 67	1.11-1.84	CITRON 66
1.87	BAKER 67	1.11-1.84	CITRON 66
1.88	BAKER 67	1.11-1.84	CITRON 66
1.89	BAKER 67	1.11-1.84	CITRON 66
1.90	BAKER 67	1.11-1.84	CITRON 66
1.91	BAKER 67	1.11-1.84	CITRON 66
1.92	BAKER 67	1.11-1.84	CITRON 66
1.93	BAKER 67	1.11-1.84	CITRON 66
1.94	BAKER 67	1.11-1.84	CITRON 66
1.95	BAKER 67	1.11-1.84	CITRON 66
1.96	BAKER 67	1.11-1.84	CITRON 66
1.97	BAKER 67	1.11-1.84	CITRON 66
1.98	BAKER 67	1.11-1.84	CITRON 66
1.99	BAKER 67	1.11-1.84	CITRON 66
2.00	BAKER 67	1.11-1.84	CITRON 66
2.01	BAKER 67	1.11-1.84	CITRON 66
2.02	BAKER 67	1.11-1.84	CITRON 66

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REACTION/MOMENTUM INDEX (CONT'D)

[illegible]

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REACTION/MOMENTUM INDEX (CONT'D)

[illegible]

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9.4.105 31.01.2024

[illegible]

[illegible]

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REACTIONS 3554 TO 3425

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3590	3591	3592	3593
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3646	3647	3648	3649
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3654	3655	3656	3657
3658	3659	3660	3661
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3794	3795	3796	3797
3798	3799	3800	3801
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10.3. ABERCROMBIE 717	10.2. ABERCROMBIE 717	CARTER 71	420 ZIMOV 60E
10.4. ABERCROMBIE 717	10.3. ABERCROMBIE 717	COOL 56	424 ZIMOV 59E
10.5. ABERCROMBIE 717	10.4. ABERCROMBIE 717	DEAN 62	429 ZIMOV 60B
10.6. ABERCROMBIE 717	10.5. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.7. ABERCROMBIE 717	10.6. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.8. ABERCROMBIE 717	10.7. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.9. ABERCROMBIE 717	10.8. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.10. ABERCROMBIE 717	10.9. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.11. ABERCROMBIE 717	10.10. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.12. ABERCROMBIE 717	10.11. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.13. ABERCROMBIE 717	10.12. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.14. ABERCROMBIE 717	10.13. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.15. ABERCROMBIE 717	10.14. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.16. ABERCROMBIE 717	10.15. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.17. ABERCROMBIE 717	10.16. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.18. ABERCROMBIE 717	10.17. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.19. ABERCROMBIE 717	10.18. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.20. ABERCROMBIE 717	10.19. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.21. ABERCROMBIE 717	10.20. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.22. ABERCROMBIE 717	10.21. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.23. ABERCROMBIE 717	10.22. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.24. ABERCROMBIE 717	10.23. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.25. ABERCROMBIE 717	10.24. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.26. ABERCROMBIE 717	10.25. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.27. ABERCROMBIE 717	10.26. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.28. ABERCROMBIE 717	10.27. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.29. ABERCROMBIE 717	10.28. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.30. ABERCROMBIE 717	10.29. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.31. ABERCROMBIE 717	10.30. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.32. ABERCROMBIE 717	10.31. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.33. ABERCROMBIE 717	10.32. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.34. ABERCROMBIE 717	10.33. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.35. ABERCROMBIE 717	10.34. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.36. ABERCROMBIE 717	10.35. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.37. ABERCROMBIE 717	10.36. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.38. ABERCROMBIE 717	10.37. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.39. ABERCROMBIE 717	10.38. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.40. ABERCROMBIE 717	10.39. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.41. ABERCROMBIE 717	10.40. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.42. ABERCROMBIE 717	10.41. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.43. ABERCROMBIE 717	10.42. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.44. ABERCROMBIE 717	10.43. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.45. ABERCROMBIE 717	10.44. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.46. ABERCROMBIE 717	10.45. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.47. ABERCROMBIE 717	10.46. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.48. ABERCROMBIE 717	10.47. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.49. ABERCROMBIE 717	10.48. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.50. ABERCROMBIE 717	10.49. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.51. ABERCROMBIE 717	10.50. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.52. ABERCROMBIE 717	10.51. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.53. ABERCROMBIE 717	10.52. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.54. ABERCROMBIE 717	10.53. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.55. ABERCROMBIE 717	10.54. ABERCROMBIE 717	DEAN 60	429 ZIMOV 60B
10.56. ABERCROMBIE 717			

REACTION/MOMENTUM INDEX (CONT'D)

[illegible]

REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 3494 TO 3559

REACTION INDEX (CONT'D)	REACTION INDEX (CONT'D)	REACTION INDEX (CONT'D)	REACTION INDEX (CONT'D)
3494	3500	3506	3512
3495	3501	3507	3513
3496	3502	3508	3514
3497	3503	3509	3515
3498	3504	3510	3516
3499	3505	3511	3517
3500	3506	3512	3518
3501	3507	3513	3519
3502	3508	3514	3520
3503	3509	3515	3521
3504	3510	3516	3522
3505	3511	3517	3523
3506	3512	3518	3524
3507	3513	3519	3525
3508	3514	3520	3526
3509	3515	3521	3527
3510	3516	3522	3528
3511	3517	3523	3529
3512	3518	3524	3530
3513	3519	3525	3531
3514	3520	3526	3532
3515	3521	3527	3533
3516	3522	3528	3534
3517	3523	3529	3535
3518	3524	3530	3536
3519	3525	3531	3537
3520	3526	3532	3538
3521	3527	3533	3539
3522	3528	3534	3540
3523	3529	3535	3541
3524	3530	3536	3542
3525	3531	3537	3543
3526	3532	3538	3544
3527	3533	3539	3545
3528	3534	3540	3546
3529	3535	3541	3547
3530	3536	3542	3548
3531	3537	3543	3549
3532	3538	3544	3550
3533	3539	3545	3551
3534	3540	3546	3552
3535	3541	3547	3553
3536	3542	3548	3554
3537	3543	3549	3555
3538	3544	3550	3556
3539	3545	3551	3557
3540	3546	3552	3558
3541	3547	3553	3559
3542	3548	3554	
3543	3549	3555	
3544	3550	3556	
3545	3551	3557	
3546	3552	3558	
3547	3553	3559	
3548	3554		
3549	3555		
3550	3556		
3551	3557		
3552	3558		
3553	3559		
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REACTIONS 3560 TO 3622

REACTION/MOMENTUM INDEX (CONT'D)

P1 - P -->	(CONT.)	P1 - P -->	(CONT.)	P1 - P -->	(CONT.)	P1 - P -->	(CONT.)
*# DEUT121700		*# KPRR121500	SIGMA-	KO LAMBDA	(CONT.)	*# K0 LAMBDA	(CONT.)
5.00	VANDERHAGEN 69	5.00	WATERS 70	2.45	WAHLF 67	1.00	WATERS 70
2.70	MILLER 67	25.0	WATERS 70	2.60	WAHLF 67	1.00	WATERS 70
2.00	ZANIS 65	*# K1 K5		2.70	WAHLF 67	1.00	WATERS 70
3.22	CHUNG 65	25.0	WATERS 70	2.75	WATERS 70	1.00	WATERS 70
3.25-5.76	GUZHAVIN 76	25.0	WATERS 70	2.80	WAHLF 67	1.00	WATERS 70
3.63	LEE 67	*# K1 K5		2.85	WAHLF 67	1.00	WATERS 70
4.00	BONDAR 63	*# K1 K5		2.90	WAHLF 67	1.00	WATERS 70
4.16	EISNER 67	25.0	WATERS 70	2.95	WAHLF 67	1.00	WATERS 70
4.50	HOLLOWAY 74	*# K5 HYPERON		3.00	WAHLF 67	1.00	WATERS 70
5.76	GUZHAVIN 76	25.0	WATERS 70	3.05	WAHLF 67	1.00	WATERS 70
6.70	LEE 67	*# K5 ANYTHING		3.10	WAHLF 67	1.00	WATERS 70
6.00-7.00	POLY:HYRONAK 78	7	LUJING 76	3.15	WAHLF 67	1.00	WATERS 70
6.95	CARROLL 74B	*# K5 K5		3.20	WAHLF 67	1.00	WATERS 70
1.00	CH 70B	*# K5 K5		3.25	WAHLF 67	1.00	WATERS 70
8.00	ALLARD 67	*# K5 K5		3.30	WAHLF 67	1.00	WATERS 70
	EISENSTEIN 787	*# K5 K0 + K0 K5 + K5 K5		3.35	WAHLF 67	1.00	WATERS 70
13.0	PCIRIR 67	25.0	WATERS 70	3.40	WAHLF 67	1.00	WATERS 70
11.0	WALLIS 66	*# K5 K5		3.45	WAHLF 67	1.00	WATERS 70
12.0	CASO 67	*# K5 K5		3.50	WAHLF 67	1.00	WATERS 70
12.0	ALEXANDER 777	25.0	WATERS 70	3.55	WAHLF 67	1.00	WATERS 70
12.0	ARENTON 787	*# K5 LAMBDA		3.60	WAHLF 67	1.00	WATERS 70
12.0-13.0	ALEXANDER 777	25.0	WATERS 70	3.65	WAHLF 67	1.00	WATERS 70
15.0	ALLAN 70C	*# K5 LAMBDA		3.70	WAHLF 67	1.00	WATERS 70
16.0	BARTON 76	*# K5 SIGMA		3.75	WAHLF 67	1.00	WATERS 70
17.0	MCR/ABBC/CH 707	*# K5 SIGMA		3.80	WAHLF 67	1.00	WATERS 70
32.5-48.0	BOLCTOV 74B	25.0	WATERS 70	3.85	WAHLF 67	1.00	WATERS 70
*# NOV-85		*# K5 SIGMA-		3.90	WAHLF 67	1.00	WATERS 70
10.0	GRASSLER 76	25.0	WATERS 70	3.95	WAHLF 67	1.00	WATERS 70
*# N1152003		*# K0		4.00	WAHLF 67	1.00	WATERS 70
9.30-12.0	FERRER 78	11.4	FERRER 78	4.05	WAHLF 67	1.00	WATERS 70
*# N1152003		16.0	FERRER 78	4.10	WAHLF 67	1.00	WATERS 70
6.00	ABRASH/CH 756	*# K0 LAMBDA		4.15	WAHLF 67	1.00	WATERS 70
*# N1188F510		7	BERTAN 62	4.20	WAHLF 67	1.00	WATERS 70
6.00-12.0	FERRER 78	CONVERSI 58		4.25	WAHLF 67	1.00	WATERS 70
*# N1100013		LEVI 71		4.30	WAHLF 67	1.00	WATERS 70
13.0	CASO 797	WANDER 68		4.35	WAHLF 67	1.00	WATERS 70
*# P1A P1 -> X		6.04-1.00	JONES 71B	4.40	WAHLF 67	1.00	WATERS 70
2.70	MILLER 67	9.10	JONES 71B	4.45	WAHLF 67	1.00	WATERS 70
3.00	CLEAR 67	9.15	JONES 71B	4.50	WAHLF 67	1.00	WATERS 70
3.40	LEE 67	9.20-1.10	JONES 71B	4.55	WAHLF 67	1.00	WATERS 70
4.00	BONDAR 63	9.25	JONES 71B	4.60	WAHLF 67	1.00	WATERS 70
4.16	EISNER 67	9.30	JONES 71B	4.65	WAHLF 67	1.00	WATERS 70
4.50	CH 70B	9.35	JONES 71B	4.70	WAHLF 67	1.00	WATERS 70
6.00	PCIRIR 67	9.40-1.12	CRAWFORD 59B	4.75	WAHLF 67	1.00	WATERS 70
8.10	ASO 67	9.45	CRAWFORD 59B	4.80	WAHLF 67	1.00	WATERS 70
16.0	BRELLAN 70C	9.50	CRAWFORD 59B	4.85	WAHLF 67	1.00	WATERS 70
	BELLINI 78	9.55	CRAWFORD 59B	4.90	WAHLF 67	1.00	WATERS 70
*# 2KS -> X		9.56	CRAWFORD 59B	4.95	WAHLF 67	1.00	WATERS 70
5.30-12.0	BIJUSCH 67	9.58	CRAWFORD 59B	5.00	WAHLF 67	1.00	WATERS 70
*# P210 -> X		9.59	CRAWFORD 59B	5.05	WAHLF 67	1.00	WATERS 70
17.0	WALLIS 66	9.60	CRAWFORD 59B	5.10	WAHLF 67	1.00	WATERS 70
*# P21A P21 -> X		9.61	CRAWFORD 59B	5.15	WAHLF 67	1.00	WATERS 70
3.27-4.70	CHUNG 68	9.62	CRAWFORD 59B	5.20	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		9.63	CRAWFORD 59B	5.25	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 -> X		9.64	CRAWFORD 59B	5.30	WAHLF 67	1.00	WATERS 70
6.00	WANDLER 65	9.65	CRAWFORD 59B	5.35	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 -> X		9.66	CRAWFORD 59B	5.40	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.67	CRAWFORD 59B	5.45	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 -> X		9.68	CRAWFORD 59B	5.50	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.69	CRAWFORD 59B	5.55	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 -> X		9.70	CRAWFORD 59B	5.60	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.71	CRAWFORD 59B	5.65	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 -> X		9.72	CRAWFORD 59B	5.70	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.73	CRAWFORD 59B	5.75	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 -> X		9.74	CRAWFORD 59B	5.80	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.75	CRAWFORD 59B	5.85	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.76	CRAWFORD 59B	5.90	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.77	CRAWFORD 59B	5.95	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.78	CRAWFORD 59B	6.00	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.79	CRAWFORD 59B	6.05	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.80	CRAWFORD 59B	6.10	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.81	CRAWFORD 59B	6.15	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.82	CRAWFORD 59B	6.20	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.83	CRAWFORD 59B	6.25	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.84	CRAWFORD 59B	6.30	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.85	CRAWFORD 59B	6.35	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.86	CRAWFORD 59B	6.40	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.87	CRAWFORD 59B	6.45	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.88	CRAWFORD 59B	6.50	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.89	CRAWFORD 59B	6.55	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.90	CRAWFORD 59B	6.60	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.91	CRAWFORD 59B	6.65	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.92	CRAWFORD 59B	6.70	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.93	CRAWFORD 59B	6.75	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.94	CRAWFORD 59B	6.80	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.95	CRAWFORD 59B	6.85	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.96	CRAWFORD 59B	6.90	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.97	CRAWFORD 59B	6.95	WAHLF 67	1.00	WATERS 70
*# P1 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 K5 -> X		9.98	CRAWFORD 59B	7.00	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	9.99	CRAWFORD 59B	7.05	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.00	CRAWFORD 59B	7.10	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.01	CRAWFORD 59B	7.15	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.02	CRAWFORD 59B	7.20	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.03	CRAWFORD 59B	7.25	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.04	CRAWFORD 59B	7.30	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.05	CRAWFORD 59B	7.35	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.06	CRAWFORD 59B	7.40	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.07	CRAWFORD 59B	7.45	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.08	CRAWFORD 59B	7.50	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.09	CRAWFORD 59B	7.55	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.10	CRAWFORD 59B	7.60	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.11	CRAWFORD 59B	7.65	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.12	CRAWFORD 59B	7.70	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.13	CRAWFORD 59B	7.75	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.14	CRAWFORD 59B	7.80	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.15	CRAWFORD 59B	7.85	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.16	CRAWFORD 59B	7.90	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.17	CRAWFORD 59B	7.95	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.18	CRAWFORD 59B	8.00	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.19	CRAWFORD 59B	8.05	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.20	CRAWFORD 59B	8.10	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.21	CRAWFORD 59B	8.15	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.22	CRAWFORD 59B	8.20	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.23	CRAWFORD 59B	8.25	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.24	CRAWFORD 59B	8.30	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.25	CRAWFORD 59B	8.35	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.26	CRAWFORD 59B	8.40	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.27	CRAWFORD 59B	8.45	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.28	CRAWFORD 59B	8.50	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.29	CRAWFORD 59B	8.55	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.30	CRAWFORD 59B	8.60	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.31	CRAWFORD 59B	8.65	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.32	CRAWFORD 59B	8.70	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.33	CRAWFORD 59B	8.75	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.34	CRAWFORD 59B	8.80	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.35	CRAWFORD 59B	8.85	WAHLF 67	1.00	WATERS 70
*# P1 K5 -> X		10.36	CRAWFORD 59B	8.90	WAHLF 67	1.00	WATERS 70
4.50	DIAMOND 70	10.37	CRAWFORD 59B	8.95	WAHLF 67	1.00	WATERS 70
*# P1 K5 ->							

REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 3803 TO 3853

[illegible]

REACTION/MOMENTUM INDEX (CONT'D)

REACTIONS 3854 TO 3886

[illegible]

PART III

VOCABULARIES

PARTICLE VOCABULARY

Discussion

There are about 300 distinct particle names appearing in this report, counting all charge states. In this vocabulary, we provide lists of the names of these particles, ordered both alphabetically and by particle type.

Particle-type order is as follows: photon, leptons, non-strange-mesons, strange mesons, charmed mesons, a few generic mesons, baryons in the order $S=0, -1, -2, -3, +1, \neq 0$, some special baryons, nuclei, and finally, some other special particles, such as α , β , γ , π^0 . Within each category, particles are ordered by increasing mass.

Most particle names are as used in the Review of Particle Properties (Reviews of Modern Physics 52, No. 2, Part II, April 1980) and require no special explanation. For baryon names, we have a convention: NAME(MASS I (SPIN 2*))CHARGE, where 'SPIN' is equal to 1 for integral isospin and 2*1 otherwise, e.g., DEL(1690P33)++; if some of the quantum numbers are uncertain, a B (for bump) may follow the MASS, e.g., DEL(1953B)++. Mesons are given their vernacular names. If the particle has only a neutral state (e.g., LAMBDA) or the charge is unspecified (e.g., PION), no charge is given. The antiparticles of all baryons, neutral leptons, and neutral strange or charmed mesons are formed by prefixing the particle name with an 'A'. The charge is that of the antiparticle, so that, for example, AXI+ is the antiparticle for XI-.

If there is more than one occurrence of a particle in a final state, the number of occurrences is prefixed to the particle name (e.g., 2PI+). Where the exact number of such particles is unknown, but a lower limit to the number is given, our convention, illustrated for π^0 , is as follows: (PIOS) means '0 or more π^0 's'; PI(5) means '1 or more π^0 's'; PI(5), '2 or more π^0 's'.

The 'particle' ANYTHING is used to mean 'the particles listed plus anything else': for example, PI+ ANYTHING refers to inclusive π^+ channels, while just ANYTHING in the final state refers to total cross-section measurements.

The special 'particles' in our N05-k's are so designated, when written in reactions, by angular brackets containing the differentiation or associated

or non-resonant final states. For example, $PI+P \rightarrow P\ 9D \langle 2PI+PI \rangle$ means that the PI beam dissociates diffractively into $2PI+PI$; $PI+P \rightarrow N05-R1S \langle P\ 2PI+PI \rangle$ indicates the non-resonant part of the reaction $PI+P \rightarrow P\ 2PI+PI$.

Ambiguities

There are ambiguities in our particle names, especially for generic names. For example, STRANGE0 and VEE can be ambiguous; in principle, the first refers to neutral strange particles, detected or not, while the second refers only to those detected as vee decays in track-sensitive detectors. Some ambiguities are historical in origin, caused by changes in nomenclature as particle properties became better determined. For example, the early searches for heavy leptons were encoded using the generic name BVY=L⁺PTON, but some recent papers are encoded using TAU; what one paper refers to as DEL(1980B)+ might be referred to in other papers as DEL(1990F15)+, and so on. Ambiguous names usually appear close together in the type-ordered vocabulary list, and it is suggested that this list be consulted if an ambiguity could exist.

PARTICLES ORDERED ALPHABETICALLY

ADEL0 C= ADEL(123P33)0
 ADEL- C= ADEL(123P33)-
 ADEL-- C= ADEL(123P33)--
 ADO C= CHARMED PARTICLE CANDIDATE
 AG C= SILVER NUCLEUS
 ANYPERON C= GENERAL ANTI-HYPERON
 AKAPPA(1250)0 C= AKPI S-WAVE
 AKK(1800)0
 AKPI(530)--
 AKPRIME(1400)0 C= JP=0- STATE SEEN IN PWA BY BRANDENBURG; Z_0 ,
 DECAYING PREDOMINANTLY INTO LPSILON K0
 AKO
 AK*(1430)0
 AK*(892)0
 AL C= ALUMINUM NUCLEUS
 ALAMBDA
 ALAM(1405S01)
 ALAM(1520D03)
 AL(1770)0 C= ANTI-L 1770)0
 AN C= ANTI ELECTRON
 ANN(1=0) C= ANTI-NUCLEON NUCLEON 1=0 INITIAL STATE (AND
 ELASTIC FINAL STATE)
 ANN(1915)0 C= NARROW N AN STATE
 ANU
 ANYTHING C= FOR USE IN INCLUSIVE REACTIONS, ALSO FOR
 CROSS-SECTION DATA, AS IN K- P --> ANYTHING
 AN(1470B)-
 ANOMEGA+
 AP
 APRIME(1800)+ C= JP1 STATE
 APRIME(1800)- C= JP1 STATE
 AQ(1240-1400)0
 ASIGMA0 ASIGMA+ ASIGMA-
 ASIG(1385P13)0 ASIG(1385P13)+ ASIG(1385P13)-
 AU C= GOLD NUCLEUS
 AXI0 AXI+
 A1(1100)0 A1(1100)+ A1(1100)-
 A1.5(1170)+ A1.5(1170)-
 A2(1310)0 A2(1310)+ A2(1310)-
 A3(1660)0 A3(1660)+ A3(1660)-
 A4(1900)+ A4(1900)-
 A-REGION C= REGION AROUND A1 AND A2
 BE C= BERYLLIUM NUCLEUS
 B(1235)0 B(1235)+ B(1235)-
 C C= CARBON NUCLEUS
 CC C= CHARGE CONJUGATE REACTION
 CHARGED C= A CHARGED TRACK ORIGINATING FROM THE PRIMARY
 INTERACTION. ASSUMES OBSERVED OR UNOBSERVED
 NEUTRALS MAY BE PRESENT, BUT ARE IGNORED UNLESS
 SPECIFICALLY MENTIONED.
 CHARGED+ C= POSITIVE CHARGED PARTICLE
 CHARGED- C= NEGATIVE CHARGED PARTICLE
 CU C= COPPER NUCLEUS

DD C= DIFFRACTION DISSOCIATION, TO BE FOLLOWED BY
 STATUS OF PARTICLES WHICH WERE PRODUCED VIA
 DIFFRACTION DISSOCIATION, E.G. DD <P P10>
 DELIA(980)0 DELIA(980)+ DELIA(980)-
 DEL0 C= DEL(123P33)0
 DEL+ C= DEL(123P33)+
 DEL++ C= DEL(123P33)++
 DEL- C= DEL(123P33)-
 DEL UNSPEC++ C= 1+1/2 BARYON OF UNSPECIFIED MASS, USE PRIMARILY
 IN PROP. KWTE, CORP
 DEL(1650S33)0
 DEL(1670D33)0 DEL(1670D33)+ DEL(1670D33)++
 DEL(1690P33)++ C= BIMP IN PRODUCTION EXPERIMENT
 DEL(1880B)+ DEL(1890F35)++
 DEL(1950B)0 DEL(1950B)+ DEL(1950B)++
 DEL(1950F37)+ DEL(1950F37)++
 DEL(2420B)++
 DEL(2850B)++
 DELT
 DEUT*(2170)0 DEUT*(2170)+ DEUT*(2170)++
 D0 C= CHARMED PARTICLE CANDIDATE
 D+ C= CHARMED PARTICLE CANDIDATE
 D- C= CHARMED PARTICLE CANDIDATE
 D(1285)
 DPSILON(790) C= PIP1 S-WAVE (SEAR 700 MEV)
 ETA
 ETAPRIME
 E+ C= POSITRON
 E- C= ELECTRON
 E(1420)
 F C= F(1270) MESON RESONANCE
 F0 C= IRON NUCLEUS
 FPRIME
 F(1540)0 F(1540)+
 GAMMA
 GAMMA* C= VIRTUAL GAMMA
 G(1700)0 G(1700)+ G(1700)-
 HADRON C= SINGLE HADRON, ANY CHARGE OR MASS
 HADRONS C= TWO OR MORE HADRONS
 HADRON+ C= CHARGE + HADRON
 HADRON- C= CHARGE - HADRON
 HE C= HELIUM-4 NUCLEUS
 HYPERON C= GENERAL HYPERON
 HYPERON0 C= GENERAL HYPERON OF CHARGE 0
 H(2040) C= 1=0, JP=4+ MESON RESONANCE
 H(990)
 INELASTIC C= SAME AS ANYTHING, EXCEPT ELASTIC EXCLUDED
 JET C= JET DETECTED AS A WHOLE
 J/PSI(3100)0
 KAON C= EXACTLY ONE KAON OR ANTON OF UNSPECIFIED CHARGE
 KAONS C= TWO OR MORE UNSPEC KAONS
 KAPPA(1250)0 C= KPI S-WAVE
 KAPPA(1250)+ C= KPI S-WAVE

SIG(1670D13)+ SIG(1670D13)0 SIG(1670D13)-
 C= 1+1, Y=0 BUMPS
 SIG(1670B)+ C= 1+1, Y=0 BUMPS
 SIG(1670B)0 C= 1+1, Y=0 BUMPS
 SIG(1670B)- C= 1+1, Y=0 BUMPS
 SIG(1690B)+ C= 1+1, Y=0 BUMPS
 SIG(1765D15)+ SIG(1765D15)0 SIG(1765D15)-
 SIG(1880F11)-
 SIG(1915F15)+ SIG(1915F15)0
 C= 1+1, Y=0 BUMPS
 SIG(2030F17)0
 SIG(2620B)0 C= 1+1, Y=0 BUMPS
 XI0 XI-
 XI C= XI(1320) OF UNSPECIFIED CHARGE
 AXI+ AXI0
 XI(1530P13)0 XI(1530P13)-
 XI(1630)0 XI(1630)-
 XI(1820)0 XI(1820)-
 XI(1940)0 XI(1940)-
 XI(2030)0 XI(2030)-
 XI(UNSPEC) C= 1+1/2, Y=-1 BARYON OF UNSPEC MASS
 XI*(UNSPEC)-- C= Y=-1 BARYON OF UNSPEC MASS, 1
 OMEGA- C= THE S=-J BARYON
 AOMEGA+ C= GENERAL HYPERON OF CHARGE 0
 HYPERON0 C= GENERAL HYPERON
 HYPERON C= GENERAL ANTI-HYPERON
 ANHYPERON C= F NUCLEON 1=0 INITIAL STATE (AND ELASTIC FINAL STATE)
 NN(I=0) C= EXOTIC 1+1, Y=2 BARYON
 ZI(i900)+
 DEUT NN(I=0) C= NUCLEON NUCLEON 1=0 INITIAL STATE (AND ELASTIC FINAL STATE)
 DEUT*(2170)0 DEUT*(2170)++ DEUT*(2170)+
 HE C= HELIUM-4 NUCLEUS
 BE C= BERYLLIUM NUCLEUS
 C C= CARBON NUCLEUS
 NE C= NEON NUCLEUS
 AL C= ALUMINUM NUCLEUS
 SI C= SILICON NUCLEUS
 TI C= TITANIUM NUCLEUS
 FE C= IRON NUCLEUS
 CU C= COPPER NUCLEUS
 AG C= SILVER NUCLEUS
 SN C= TIN NUCLEUS
 WT C= TUNGSTEN NUCLEUS -- NOTE NAME IS NOT SAME AS CHEMICAL SYMBOL
 AU C= GOLD NUCLEUS
 PB C= LEAD NUCLEUS
 U C= URANIUM NUCLEUS
 NUCLEUS C= GENERAL NUCLEUS. USE ONLY WHEN THE EXACT NUCLEUS OR NUCLEON IS NOT SPECIFIED. E.G., USE FOR TARGET WHEN DETECTOR IS EMULSION.
 W C= INTERMEDIATE VECTOR BOSON
 HADRON+ C= CHARGE + HADRON

HADRON- C= CHARGE - HADRON
 HADRON C= SINGLE HADRON, ANY CHARGE OR MASS
 HADRONS C= TWO OR MORE HADRONS
 STRANGE0 N= NEUTRAL STRANGE PARTICLE C= SAME AS STRANGE EXCEPT CHARGE IS SPECIFIED
 STRANGE C= UNSPECIFIED STRANGE PARTICLE
 STRANGE* C= TWO OR MORE UNSPECIFIED STRANGE PARTICLES
 STRANGE(S) C= ONE OR MORE UNSPECIFIED STRANGE PARTICLES
 VEE C= SEEN UNSPECIFIED NEUTRAL STRANGE PARTICLE DECAY
 CHARGED+ C= POSITIVE CHARGED PARTICLE
 CHARGED- C= NEGATIVE CHARGED PARTICLE
 N(CHARGED) C= CHARGED PARTICLE, FOR MULTIPLICITY DISTRIBUTION ONLY
 .GT.9PRONG C= MORE THAN 9 PRONGS
 .GT.7PRONG C= MORE THAN 7 PRONGS
 .GT.5PRONG C= MORE THAN 5 PRONGS
 .GT.3PRONG C= MORE THAN 3 PRONGS
 CHARGED C= A CHARGED TRACK ORIGINATING FROM THE PRIMARY INTERACTION. ASSUMES OBSERVED OR UNOBSERVED NEUTRALS MAY BE PRESENT, BUT ARE IGNORED UNLESS SPECIFICALLY MENTIONED.
 PRONGS C= TWO OR MORE PRONGS
 MM.GE.2 C= TWO OR MORE UNDETECTED NEUTRAL PARTICLES
 NEUTRALS C= TWO OR MORE NEUTRAL PARTICLES -- DO NOT USE FOR MM.GE.3
 NEUTRAL(S) C= ONE OR MORE NEUTRAL PARTICLES -- DO NOT USE FOR MM.GE.1
 JET C= JET DETECTED AS A WHOLE
 ANYTHING C= FOR USE IN INCLUSIVE REACTIONS, ALSO FOR CROSS-SECTION DATA, AS IN K- P --> ANYTHING
 INELASTIC C= SAME AS ANYTHING, EXCEPT ELASTIC EXCLUDED
 CC C= CHARGE CONJUGATE REACTION
 DD C= DIFFRACTION DISSOCIATION. TO BE FOLLOWED BY NAMES OF PARTICLES WHICH WERE PRODUCED VIA DIFFRACTION DISSOCIATION. E.G. DD <P P10>
 NON-RES C= NON-RESONANT STATE. TO BE FOLLOWED BY NAMES OF PARTICLES WHICH WERE PRODUCED IN A NON-RESONANT STATE. E.G. NON-RES <P P1+>

KINEMATIC VARIABLE VOCABULARY

The following material is a modified form of Appendix XX from the "Particle Physics Data System Reaction-Data File Encoding Manual;" the entire manual can be found on a special fiche included with this report.

A word on notation: Angular brackets, $\langle$ and $\rangle$, are used below to enclose any variable which may take on various literal values; the brackets themselves are not actually encoded. Also, values written in all capital letters are literals which are encoded just as they appear.

Introduction

The names of independent kinematic variables are referred to as x-names. These appear in various places throughout each Data Listing entry:

- 1) To define each data point in an entry, in addition to the dependent variable name (y-name) and reaction, at least one independent variable must be specified.
- 2) X-names (and more often y-names) are also used to define what variable a systematic error applies to or under what conditions it applies.
- 3) Finally, the names of some dependent variables (y-names) are constructed using x-names as some of their components (see the Observable Vocabulary).

The number of independent variables that have been used to describe high energy physics experimental data is very large. To cope with this diversity, we have defined a syntax for constructing x-names.

The x-name syntax consists of the following elements and rules for combining elements:

- 1) There is a list of basic x-names around which all x-names are built; examples from this list include THETA, T, E, P, etc. (the full list is given below).
- 2) For each basic x-name, there are defined a number of arguments (the number differs for different basic x-names), which are used to specify the variable precisely (the structure and functions of arguments are discussed in detail below).
- 3) X-names of variables which are simply related to those constructed using elements 1) and 2) can be formed using FORTPAN-like operators such as SIN, COS, SQRT, etc. (a full list is given below).

4) X-names of even more complex variables may be created by the use of operators such as +, -, *, /, **, etc. as in FORTRAN (the full list of operators is given below).

5) Finally, constants may be combined with x-names constructed from rules 1) - 4) above by using any of the operators defined in 3) and 4).

If an x-name cannot be constructed from the x-name syntax, then that x-name is written in the format: This has the following form: $\langle$ tree format $\rangle$. This form is to be used whether the x-name which cannot be encoded in the x-name syntax is the entire name or just part of it, as in, say, a y-name. In the latter case, the entire y-name must be written in tree format.

In the remainder of this Vocabulary, we discuss the x-name syntax in much greater detail, presenting complete lists of basic x-names, all possible arguments, and operators. And finally we give examples to illustrate how the syntax is used.

X-name Argument Structure

The simplest form of an x-name with arguments is the following:

$\langle$ basic-x-name $\rangle$ ($\langle$ arg-name $\rangle$ = $\langle$ arg-value $\rangle$,
 $\langle$ arg-name2 $\rangle$ = $\langle$ arg-value2 $\rangle$,...)

where:

- 1) $\langle$ basic-x-name $\rangle$ is one of the names from the Table of Basic X-names presented below.
- 2) $\langle$ arg-name $\rangle$ is the name of any argument permitted for this particular basic x-name; the permissible arguments and their defaults (if any) are given in the Table of Basic X-names. The list of all possible argument names and their meanings is given in a separate section below.
- 3) $\langle$ arg-value $\rangle$ is the value of the argument. The form depends on the argument type and is discussed in the section in which all argument types are presented.

The following general remarks apply to arguments:

- 1) Arguments may appear in any order.
- 2) Any argument for which a default value is given in the Basic X-name Table below may be omitted if the default is applicable; e.g., $D(SIG)/DT$ may appear instead of $D(SIG)/DT(P=1,P=1)$.
- 3) If all arguments have been omitted, then the left and right

parentheses may have been dropped also.

The purpose of arguments to basic x-names is to supply information which, when combined with the basic name, completely specifies the independent variable.

The Types of Arguments and Their Meanings

1) P: The form "P..." is used to specify: a) the particle (or system of particles) whose property (momentum, energy, angle, etc.) is being reported; or b) the momentum, or momentum direction, of a particle (or system of particles) needed in the definition of a variable.

2) X,Y,Z: These three arguments are needed for some variables to define a right-handed system of coordinate axes for reference. The values of these arguments are the particles (or systems of particles) whose momentum vectors define the appropriate directions (see below for how these values are encoded). For certain coordinate axes, X,Y,Z may be replaced by XYZ; see next.

3) XYZ: This single argument is used instead of the three X,Y,Z arguments for those cases for which we have defined an abbreviation to specify some of the more common coordinate systems; see the 'Special Coordinate Systems' section below.

4) RF: This argument indicates the particle (or system of particles) in whose rest frame the measured quantity is reported.

To understand how P, X, Y, Z, and RF are encoded, see the 'Specifying Particles and Directions' section below.

5) NAME: Occasionally, a variable has an accepted name of its own. In this given. This arises more often with y-names.

6) DEF: This argument can be used to define unambiguous variables (such as XL) which has more than one definition in common use.

7) Q: This qualifier is a special, rarely used, "labeling" or "linking" argument. Its use is confined to the following circumstances: When a y-name is composed of more than one basic y-name, and there is ambiguity as to which x-name value are associated with which basic y-name, this ambiguity is resolved by giving the basic y-name and relevant x-name the same, arbitrary (possibly mnemonic) value for the Q argument. An example might be:

$$d\sigma(\theta=90^\circ)/d\Omega/dE(\theta=90^\circ/dE).$$

This is encoded (suppressing arguments and variables not relevant to this discussion) as follows:

```
x-name1 = THETA(Q=1) IS DEG,    x-value1 = 90,  
x-name2 = THETA(Q=2) IS DEG,    x-value2 = 0,  
y-name = (D(SIG(Q=1))/DT)/(D(SIG(Q=2))/DT).
```

The Q argument is only used in cases where there is ambiguity, and for each such ambiguity a different Q value is required. An convenient character(s) may be used for the value of Q.

This argument is used also in the situation where more than one reaction is needed to characterize a measurement, as in the case of ratios of cross sections of reactions, and there is ambiguity as to which reaction the y-name in question applies to. E.g.:

```
x-name1 = RE(Q=SEL) IS DEG,    x-value1 = P P --> P P,  
x-name2 = RE(Q=TD) IS DEG,    x-value2 = P P --> ANYTHING,  
y-name = (D(SIG(Q=SEL))/DT)/(D(SIG(Q=TD))/DT) IS GEV**2.
```

Specifying Particles and Directions

P,X,Y,Z,RF: The value of any one of these arguments specifies a particle (or system of particles) in the reaction, or the direction of the momentum of the particle (or system of particles), or the momentum itself. In all these cases, the particle (or system of particles) is encoded in the same way: each particle or its momentum is represented by a number corresponding to the position of the particle in the reaction (see below), and each system of particles is represented by the sequence of numbers assigned to the particles which comprise the system. 'Directions' are represented directly in terms of a particle's (or system of particles') momentum are expressed in the negative order in construction of appropriate cross products as discussed below. The rules for constructing any value for the above-listed arguments are given, in more detail, by the following:

a) Particles are numbered from left to right as written in the reaction (starting with the beam), with every different particle given one successively higher number without regard to whether the particle is a primary particle in the reaction or is a decay product. Multiplicity occurring particles encoded with a number preceding the name (e.g., 2NNNA) are treated as the corresponding number of single particles for

Table of basic X-names

Basic variable	Arguments with default values	Meaning
Γ		
Γ		momentum
ΓE		energy
$\Gamma E T$	$\Gamma E, \Gamma E LAB$	kinetic energy
Γ		
Γ		$\Gamma = \Gamma^2$ invariant mass squared
Γ		$\Gamma = \Gamma$ energy of system of particles or invariant mass of whole particles
Γ		
Γ		Γ polar angle of Γ (deg)
Γ		$\Gamma = 2\pi(1 - \cos \Gamma)$
Γ		$\Gamma = \Gamma$ (invariant angle)
Γ		
Γ		$\Gamma = (\mathbf{p}_1 - \mathbf{p}_2)^2$ invariant momentum transfer squared
Γ		$\Gamma = \Gamma$ (invariant Γ is $\Gamma(X)$)
Γ		
Γ		$\Gamma = \Gamma$ (invariant Γ is Γ)
Γ		$\Gamma = \Gamma$ (invariant Γ is Γ)
Γ		Γ, Γ, Γ are all mostly negative

Γ may appear as a constant Γ or Γ in Γ or Γ .

X=NAME: EXAMP1.D

Consider the reaction:

1 2 3 4 5 6 7

where the particle number is given below each particle in the reaction. Thus:

DATA:

P(P=1,KP=LAB)	for beam momentum in the LAB frame
P	
P(P=7,S=5)	for the momentum of π^+ (from Δ^{++} to π^+) frame
S(P=3,4)	for invariant mass squared of $\pi^+\pi^-$ system
S(P=1,2)	for overall CM energy squared
S	
COS(THETA(P=3,4,P=1,KF=CM))	for cosine of polar angle between the π^+ state and the incoming π^+
T(P=1,P=1)	for the momentum transfer from π^+ to π^+
-T	
-T(P=3,4,P=1)	for $-t'$ between initial π^+ and outgoing π^- system
SQR1(-T(P=1,P=1))	for $(-t)^{1/2}$ between beam and outgoing π^+
SQR1(-T)	
T(P=1,P=7),0	for t_{12}

OBSERVABLE VOCABULARY

The following material is a modified form of Appendix YN from the "Particle Physics Data System Reaction-Data File Encoding Manual;" the entire manual can be found on a special tape included with this report.

A word on notation: Angular brackets, $\langle$ and $\rangle$, are used below to enclose any variable which may take on various literal values; the brackets themselves are not actually encoded. Also, values written in all capital letters are literals which are encoded just as they appear.

Introduction

The name of the dependent variable, or "observable", is referred to as a y-name.

Even the number of "basic" y-names, i.e., the classes of observables such as cross sections, polarizations, correlations, etc., is very large. The number of y-names actually used is overwhelmingly large. Since, in general, the basic observables may be reported in different reference frames and for different particles or combinations of particles. Furthermore, they are often differentiated or integrated with respect to the various independent variables on which they depend. Finally, an innumerable number of y-names may be constructed from those just described by combining them using operations such as $\sqrt{\quad}$, $\ln$, $+$, $-$, $*$, $/$, $**$, or with any of the x-names defined for that observable, or with constants. In actual practice, all these variations are used. To cope with this diversity, we have defined a syntax for constructing y-names. This syntax contains all the elements of the x-name syntax (see the Kinematic Variable Vocabulary), plus many additional elements resulting from the much greater complexity and diversity encountered previously.

The y-name syntax consists of the following elements and rules for combining elements:

- 1) There is a list of basic y-names which defines classes of observables and around which all actual y-names are built; examples from the list include σ_T , $Y_{\pi\pi}$, $P_{\pi\pi}$, $R_{\pi\pi}$, etc. (the full list is given below).
- 2) For each basic y-name, there are defined a number of arguments (the number differs for different basic y-names), which together with the basic y-name are sufficient to completely specify some of the more simple y-names (the structure and functions of arguments are discussed in detail

below).

- 3) A large class of additional y-names can be constructed from the simple y-names obtained using elements 1) and 2) by the use of FORTRAN-like operators such as $\sin$, $\cos$, $\sqrt{\quad}$, $\ln$, $\exp$, etc. (a full list was given in the Kinematic Variable Vocabulary).

- 4) In addition to the FORTRAN-like operations defined in 3), the y-name syntax also includes a notation for expressing differentiation and integration. The details of how these are encoded are given below.

- 5) Other variations of y-names may be obtained from those which can be constructed using 1) - 4) by combining these with x-names, i.e., independent variable names (such as θ , ϕ , P , T , etc.), by using operators such as $+$, $-$, $*$, $/$, $**$, etc., and parentheses, as in FORTRAN (the full list of operators was given in the Kinematic Variable Vocabulary).

- 6) Other variations may be obtained by combining constants in the same manner as described in 5).

- 7) Finally, some y-names may be obtained by taking products, sums, differences, or ratios of y-names as defined to include all y-name features described in 1) - 6) above.

In the remainder of this Vocabulary, we discuss the y-name syntax in much greater detail. Wherever appropriate, we refer to the x-name syntax, all of which comprises part of the y-name syntax. We present a complete list of basic y-names, their argument structure, and default argument values; we also discuss the general rules for argument construction and for the combination of x-names, y-names, constants, and operators to construct the great variety of y-names used in practice in describing reaction data.

Y-name Argument Structure

The simplest type of y-name consists of a basic y-name with (possibly) arguments. This has the following form:

```
<y-name>(<arg-name>=<arg-value1>,  
      <arg-name>=<arg-value2>,...,  
      <arg-name>=<arg-valueN>)  
      <arg-name1>=<arg-value1>,  
      <arg-name2>=<arg-value2>,...
```

where:

- 1) basic-yname is one of the basic ynames listed in the tables presented below;
- 2) arg-yname is the name of an argument appearing in the particular basic yname; the permissible arguments and their default values are given in the table of basic ynames; the first 11 basic argument names and their meanings is given in a separate section of the document;
- 3) arg-value is the value of the argument; the form depends on the argument type and is discussed in the section on subroutines; these are presented:
- a) 1/: For some ynames, the same set of argument values is specified for more than one path for the particle system; in the case of joint density subroutines and correlations, in these cases, the argument names and values for each system have a similar structure, but are separated by /; the order of arguments within a group is delivered in not significant, but the order in which the argument groups are encoded may be significant, affecting such things as sign conventions;
- b) Any argument for which a default value is defined in the Basic Ynames table below may be omitted if the default value is appropriate. If the arguments are divided into groups by /, the default are applied separately for each group; if the entire list of groups is omitted but not the second, the following form is used:

$$\text{basic-yname}(\text{arg-yname1=arg-value1}, \dots, \text{arg-ynameN=arg-valueN})$$

The purpose of arguments for each yname is to express information which, when combined with the basic name, completely specifies the dependent variable tab level; in those cases where the dependent variable is complex, 1/ does not involve such things as 1/ to ynames with their basic ynames, with ynames of with a subindex.

The Types of Arguments and Units follow.

All argument types defined for ynames are also used for xnames. These arguments under the same headings are already discussed in the Kinematic Variable Worksheet and are also included in the same way. In particular, see the Ynames Variable Worksheet for a detailed discussion of the arguments P, X, Y, Z, MX, MY, MO, MI, and Q.

1) 1/: For some ynames, the same set of additional argument types which are used for xnames, their derivatives, and their values are encoded. In addition, these are angular momentum treatments. Only in the particular integer cases are possible. For example, in Legendre polynomials, only 1/ is used.

2) M: This argument represents the z-component of angular momentum; it is double the z-component if the particle has half-odd-integer spin, and is from any integer values. M is usually used in pairs, as in density matrix elements; e.g., $\rho_{1,1}(\mathbf{p}_1, \mathbf{p}_2, \mathbf{X}, \mathbf{Z}) = \rho_{1,1}(\mathbf{p}_1, \mathbf{p}_2, \mathbf{X}, \mathbf{Z})$. When the spin of a particle system is not determined precisely by its name, it is encoded also; e.g., $\rho_{1,1}(\mathbf{p}_1, \mathbf{p}_2, \mathbf{X}, \mathbf{Z}) = \rho_{1,1}(\mathbf{p}_1, \mathbf{p}_2, \mathbf{X}, \mathbf{Z})$ for the S-p wave interference density matrix element, $\mathbf{p}_1 = 10$ in the p-wave region.

Differentiation Syntax

In the following, arg is any valid yname, either basic or constructed following the rules given above. x-name is any valid x-name.

- 1) single differentiation: $\text{D}(\text{arg})/\text{d}(\text{x-name})$
- 2) multiple differentiation (in example, double):
 $\text{D}(\text{D}(\text{arg})/\text{d}(\text{x-name1})/\text{d}(\text{x-name2}), \text{ or equivalently}$
 $\text{D}(\text{D}(\text{arg})/\text{d}(\text{x-name1})/\text{d}(\text{x-name2}))$
 For example, $\rho_{1,1}(\mathbf{p}_1)/\text{d}(\mathbf{p}_1)$ for $d\rho/d\mathbf{p}$.

Integration Syntax

In the following, arg is any valid yname, either basic or constructed following the rules given above. x-name is any valid x-name.

- 1) single integration: $\text{INT}(\text{arg})/\text{d}(\text{x-name})$
- 2) multiple integration (in example, double):
 $\text{INT}(\text{INT}(\text{arg})/\text{d}(\text{x-name1})/\text{d}(\text{x-name2}), \text{ or equivalently}$
 $\text{INT}(\text{INT}(\text{arg})/\text{d}(\text{x-name1})/\text{d}(\text{x-name2}))$

Note that the integration syntax is not always needed. For example,

$$\frac{\rho_{1,1}(\mathbf{p}_1)}{\text{d}(\mathbf{p}_1)}$$

is equivalent to

x-name = T IN GEV**2,
 x-value = < t_1 > 10 < t_2 >,
 y-name = SIG IN MB.

Table of Basic Y-names

Basic Variable	Arguments with	
	Default Values	
Name	(? means no default defined)	Meaning
SIG		σ = cross section
N		number of events
SLOPE		from $\frac{d\sigma}{dt} \sim e^{(\text{SLOPE})t}$
LEG	(L=?, P=3, P=1, RF=CM)	A_L $\left\{ \begin{array}{l} \frac{d\sigma}{d\Omega} = A_L^2 \Sigma A_L P_L \end{array} \right.$
LECN		
LEGP	(L=?, P=3, P=1, RF=CM)	B_L $\left\{ \begin{array}{l} P \frac{d\sigma}{d\Omega} = B_L^2 \Sigma B_L P_L \end{array} \right.$
LECPN		
AMP	Default is spin non-flip forward amplitude in LAB	amplitude
ALPHA		RE(AMP)/IM(AMP)
PHASE		phase of AMP
POL	(P=3, Z=1*3, RF=CM)	polarization of particle P along Z
RHO	([JJ=?], MM=??, P=3, XYZ=?)	ρ_{mm}^{jj} density matrix element
POL,RHO	(ALPHA=?, P=1//MM=??, P=3, XYZ=?)	density matrix element with polar- ized photon beam
RHO,RHO	(MM=??, P=?, XYZ=?//MM=??, P=?, XYZ=?)	joint decay density matrix element
YLM	(LM=??, P=3, XYZ=?)	Y_L^m moment of particle P
STEN	(JM=??, P=3, XYZ=?)	statistical tensor

Examples of Polarization Observable Names

πN → πN

POL "polarization" - recoil or target asymmetry

POL.POL (NAME=?[, DEF=?]) double polarization measurement, e.g., NAME=A or R, spin-rotation parameters

PP → PP

POL "polarization" - recoil polarization asymmetry, or a logically equivalent polarization measurement

POL.POL (NAME=?) for a double polarization measurement, e.g., NAME=CNN, CSS, CSL, CLL, KNN, KSS, KLS, DNN or D, DSS or R, DLS or A

POL.POL.POL (NAME=?) for a triple polarization measurement, e.g., NAME=HSNS, etc.

γN → πN

POL (NAME={
TARGET
PHOTON
RECOIL
PARITY
})

target asymmetry

linearly polarized photon $\frac{\sigma_H - \sigma_V}{\sigma_H + \sigma_V}$

recoil asymmetry

(even if actually deduced from polarized beam and target measurement)

$P_{\gamma} = \frac{\sigma_N - \sigma_U}{\sigma_N + \sigma_U}$

POL.POL (NAME={
C
H
})

double polarization measurement

Examples of How Basic Y-names Are Used to Handle Special Cases

D(SIG)/OMEGA/DF (P=1)

2*MPROTOR*W1

NU*W2

$$\left. \begin{aligned} &\frac{d^2\sigma}{d\Omega dE^*} \\ &2mW_1 \\ &W_2 \end{aligned} \right\} \begin{aligned} &\text{inelastic electron scattering} \\ &ep \rightarrow e^+ + \dots \\ &\omega_2 \end{aligned}$$

D(SIG(NAME={
U
L
P
I
})) / DF

Electroproduction

$$\frac{d\sigma}{dt} = \frac{d\sigma}{dt}^U + \epsilon \frac{d\sigma}{dt}^L + \epsilon \cos\phi \frac{d\sigma}{dt}^P + \sqrt{\frac{1-\epsilon}{2}} (1+\epsilon) \cos\phi \frac{d\sigma}{dt}^I$$

POL.RHO(ALPHA=04/PM=00,XYZ=SH,NAME=R)

SIG(PARITY={
N
I
})

$\rho_{00}^{J_z}$ as in 2.1

electroproduction (polarized virtual)

where natural and unnatural parity exchange contributions are separated

AMP(1,2,3,XYZ=SI)

amplitude T_{ij}^{π} (forward direction, s-channel transverse frame)

D(SIG(CN1=Y,CN2=1))/OMEGA

$(\sigma^{++})/d$ in $pp \rightarrow p\pi$

ABS(AMP(NAME=RECOIL))

PHASE(NAME=RECOIL)

$|\sigma^{+-}|$ in $\pi^+p \rightarrow \pi^+p$

LEG(N(L=1),R1(RHO(M=10,XYZ=SH))

for Legendre coefficients of $\text{Re} \left(\frac{d\sigma}{d\Omega} \right)$

Y-name Examples

Consider the reaction:

where the particle number is given below each particle. Then use

$\sigma(\text{SIG})/\text{DT}(P=1,P=1)$ IN MB/GEV**2

or $\text{D}(\text{SIG})/\text{DT}$ IN MB/GEV**2 for SIG or for SIG_{TOT} in mb/GeV**2

Consider the reaction:

Then use:

POL for polarization P
POL* $\frac{d\sigma}{dt}$ IN MB/GEV**2 for $P*\frac{d\sigma}{dt}$
LEG(L=5) for A_N in $\frac{d\sigma}{dt} = A^2 \sum_{i=1}^L A_i^2$ in mb
LEGs(L=5) for $\frac{A_N}{A_T}$

Also, for the reaction

use

SIG IN MB for $\sigma(\text{pp})_{\text{TOT}}$ in mb

and for the reaction

use

SIG IN MB for $\sigma(\text{pp})_{\text{INELASTIC}}$ in mb

REFERENCE VOCABULARY

JOURNAL ABBREVIATIONS

AF	ARKIV FOR FYSIK
APNY	ANNALS OF PHYSICS (NEW YORK)
APP	ACTA PHYSICA POLONICA
ARPRF	ACADEMIA REPUBLICII POPULARE ROMINE, STUD. CERCET. FIZICA
AUJP	AUSTRALIAN JOURNAL OF PHYSICS
BAPS	BULLETIN OF THE AMERICAN PHYSICAL SOCIETY
CRAS	COMPTES RENDUS HEBDOMADAIRES DES SEANCES DE L'ACADEMIE DES SCIENCES
DANS	DOKLADY AKADEMII NAUK SSSR
FP	FORTSCHRITTE DER PHYSIK
HPA	HELVETICA PHYSICA ACTA
IANSF	IZVESTIYA AKADEMII NAUK SSSR, SERIYA FIZICHESKAYA
IET	INSTRUMENTS AND EXPERIMENTAL TECHNIQUES
JETP	SOVIET PHYSICS JETP
JETPL	JETP LETTERS
JP	JOURNAL DE PHYSIQUE
JPSJ	JOURNAL OF THE PHYSICAL SOCIETY OF JAPAN
NC	NUOVO CIMENTO
NCL	LETTERE AL NUOVO CIMENTO
NCS	NUOVO CIMENTO, SUPPLEMENTO
NP	NUCLEAR PHYSICS
NUKL	NUKLEONIKA
PL	PHYSICS LETTERS
PM	PHILOSOPHICAL MAGAZINE
PN	PARTICLES AND NUCLEI
PPSL	PROCEEDINGS OF THE PHYSICAL SOCIETY OF LONDON
PR	PHYSICAL REVIEW
PRL	PHYSICAL REVIEW LETTERS
PRSE	PROCEEDINGS OF THE ROYAL SOCIETY OF EDINBURGH
PRSL	PROCEEDINGS OF THE ROYAL SOCIETY OF LONDON
PTP	PROGRESS OF THEORETICAL PHYSICS
RMP	REVIEWS OF MODERN PHYSICS
SJNP	SOVIET JOURNAL OF NUCLEAR PHYSICS
SPD	SOVIET PHYSICS DOKLADY
YF	YADERNAYA FIZIKA
ZP	ZEITSCHRIFT FÜR PHYSIK

DATA LISTINGS

The Data Listings, on 65 microfiche which are included with this report, contain essentially all the information which is in our Reaction-Data database. The Listings are ordered alphabetically by the 'short code' of the document from which the data were extracted. The short code is a unique identifier assigned by us to each document; it is composed of the first author's last name, the year of issue, and a uniqueness letter or letters, if required (e.g., JONES 67). For a more complete discussion of short codes, see the text at the beginning of this report.

In steady-state, all data from a given document would be encoded in one record in the database and would appear in one unit on the fiche. Here, however, because we have used data from many sources, and for other historical reasons, data from the same paper may be broken up into several units; however, these units will be contiguous on the fiche.

For ease of reference, the first and last short codes contained on each fiche appear dictionary-style at the top of the fiche. An illustrative key to the Data Listings is given on the next page, showing the information available and the format used.

ILLUSTRATIVE KEY

DOCUMENT SHORT CODE	REFEGL 76	NP #103, 269 (1976) TT-JOB	REFERENCE(S) AND PUBLICATION TYPE(S) SEE THE REFERENCE VOCABULARY FOR JOURNAL ABBREVIATIONS
MISCELLANEOUS OVERALL COMMENTS	NAGLAY PROTON SYNCHROTRON, POLARIZED TARGET, DOUBLE SCATTERING		
	COMMENTS 'A' CHI IS ANGLE BETWEEN MAGNETIC FIELD AND BEAM DIRECTIONS 'B' SPIN ROTATION C-PARAM = R-PARAM*SIN(CHI) + A-PARAM*COS(CHI) 'C' REANALYSIS OF DATA IN DEREGEL ET AL., PL 438, 338 (1973) 'D' CHI = 86 DEG 'E' CHI = 87 DEG 'F' C-PARAM = R-PARAM*SIN(CHI) + A-PARAM*COS(CHI)		
SYSTEMATIC ERRORS, WHERE KNOWN	POL HAS SYSTEMATIC ERROR $\sim$ 5 PCT		
REACTION SEE THE REACTION MOMENTUM INDEX AND THE PARTICLE VOCABULARY FOR DEFINITIONS AND ABBREVIATIONS	COMMENT POLARIZED TARGET ASYMMETRY EQUALS RECOIL PROTON POLARIZATION BY TIME REVERSAL INVARIANCE REACTION P P $\rightarrow$ P P P IN GEV 3.83 $\pm$ 0.05		
VARYING KINEMATIC VARIABLE(S) SEE THE KINEMATIC VARIABLE VOCABULARY FOR DEFINITIONS	-T IN GEV**2	THETA IN DEG	POL
	0.383	30.3	0.19 $\leftarrow$ 0.037
	0.464	33.3	0.167 $\leftarrow$ 0.014
	0.549	35.3	0.165 $\leftarrow$ 0.016
	0.638	39.3	0.153 $\leftarrow$ 0.019
	0.736	42.3	0.099 $\leftarrow$ 0.025
	0.837	45.3	0.121 $\leftarrow$ 0.028
	0.941	48.2	0.1 $\leftarrow$ 0.032
	1.048	51.1	0.083 $\leftarrow$ 0.039
	1.159	53.9	0.11 $\leftarrow$ 0.043
	1.273	56.7	0.126 $\leftarrow$ 0.045
	1.388	59.4	0.138 $\leftarrow$ 0.055
	1.505	2	0.157 $\leftarrow$ 0.081
	1.39	59.4	0.133 $\leftarrow$ 0.027
	1.742	67.5	0.162 $\leftarrow$ 0.13
	2.097	75.1	0.119 $\leftarrow$ 0.047
	2.447	82.4	0.049 $\leftarrow$ 0.067
	2.785	89.3	-0.003 $\leftarrow$ 0.138
COMMENT(S) APPLYING TO THE FOLLOWING TABLE OF DATA SEE SECTION AT TOP OF ENTRY FOR DEFINITION	COMMENT 'A' COMMENT 'B' COMMENT 'D' REACTION P P $\rightarrow$ P P P IN GEV 3.83 $\pm$ 0.05		
NAME(S) AND VALUE(S) OF KINEMATIC VARIABLE(S) HELD CONSTANT FOR THE FOLLOWING DATA TABLE SEE THE KINEMATIC VARIABLE VOCABULARY FOR DEFINITIONS	-T IN GEV**2	THETA IN DEG	POL POL(NAME=C) (C=APPROXIMATELY R-PARAM)
	0.227	23.1	-0.12 $\leftarrow$ 0.21
	0.269	25.2	-0.17 $\leftarrow$ 0.2
	0.303	26.8	-0.28 $\leftarrow$ 0.17
	0.337	28.3	-0.31 $\leftarrow$ 0.18
	0.371	29.7	-0.1 $\leftarrow$ 0.16
	0.42	31.7	-0.34 $\leftarrow$ 0.12
	0.502	34.5	-0.41 $\leftarrow$ 0.12
	0.393	29.1	-0.275 $\leftarrow$ 0.058