DE-SC0002673 – Final Scientific/Technical Report
Fusion Simulation Program
June 5, 2012
New York University- Choong-Seock Chang
Period of Performance: 8/1/09-7/31/11

New York University, Courant Institute of Mathematical Sciences, participated in the “Fusion Simulation Program (FSP) Planning Activities” [<http://www.pppl.gov/fsp>], with C.S. Chang as the institutional PI. FSP’s mission was to enable scientific discovery of important new plasma phenomena with associated understanding that emerges only upon integration. This requires developing a predictive integrated simulation capability for magnetically-confined fusion plasmas that are properly validated against experiments in regimes relevant for producing practical fusion energy.

The specific institutional goal of the New York University was to participate in the planning of the edge integrated simulation, with emphasis on the usage of large scale HPCs, in connection with the SciDAC CPES project which the PI was leading. New York University successfully completed its mission by participating in the various planning activities, including the edge physics integration, the edge science drivers, and the mathematical verification. The activity resulted in the combined report that can be found in <http://www.pppl.gov/fsp/Overview.html>. Participation and presentations as part of this project are listed in a separate file.

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Attachment I - Presentations at Conferences:

C.S.Chang, "*A few examples of Applied Math in CPES*," FSP Workshop, General
Atomics, San Diego, CA, February 8-11, 2011

C.S. Chang, "Anticipated XGC1 capability in 3-5 years," FSP Workshop, General
Atomics, San Diego, CA, February 8-11, 2011

C.S. Chang, "Design Elements of EFFIS and Weak & Strong Couplings in CPES," EU-US
Workshop on Software Technologies for Integrated Modeling in Fusion,
Gothenburg Sweden, December 1-3, 2010

C.S. Chang, "Tour de Project: Proto-FSP CPES," EU-US Workshop on Software
Technologies for Integrated Modeling in Fusion, Gothenburg Sweden, December 1-3,
2010

C.S. Chang, "Extreme Scale Computing with the Fusion Particle Code XGC1," Fall
Creek Falls Conference, The University of Tennessee, October. 24-27, 2010

C.S. Chang, "Overview of the physics-design principles at Proto-FSP CPES," Proto-
FSP assessment Meeting, Aug. 30 – Sept. 1, 2010, PPPL, Princeton, NJ

C.S. Chang, "Plasma Turbulence and Transport," Large Scale Computing and Storage
Requirements for Fusion Energy Sciences, Washington DC, Aug. 3-4, 2010,
Washington DC

C.S. Chang, "Requirements and Science goals for Sustained Petascale Fusion
Simulation with Eyes on the Exaflop Horizon," SciApps-10, ORNL, TN, August 3–6,
2010

C.S. Chang, "Integration framework design at CPES," FSP Planning Meeting, Boulder,
CO, March 14 -19, 2010

C.S. Chang, "Edge component codes," FSP Planning Meeting, Boulder, CO, March 14 -
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