Results of the Horton SciDAC Subcontract to Prof Zhihong Lin's Team

Conference Reports and Talks

"*Validation of Electron Transport Models in ECH driven TCV Plasmas,"* W. Horton, J. Kim, E. Asp, TCV Team, Joint EU-US Transport Task Force Workshop, San Diego, CA, April 28-May 1, 2009.

"*Turbulent Impurity Transport Modeling on Alcator C-Mod Tokamak*," W. Horton, X. Fu, I. Bespamyatnov, S. Benkadda, S. Futatani, X. Garbet, Association Euratom-CEA, Cadarache, France, June 8, 2009.

"*Electromagnetic Eigenmodes and Spectral Gaps*", J. Pratt, W. Horton at 21st US Transport Taskforce Workshop, March 25-28, 2008.

Publications in Peer Viewed Journals

Tomo-Hiko Watanabe, Yashushi Todo, Wendell Horton,
Benchmark Tests of Fusion Plasma Simulation Codes for Studying Microturbulence and Energetic Particle Dynamics, Plasma and Fusion Research 3, 061 (2008).

Isao Katanuma, V. Pastukhov, T. Imai, T. Kariya, Y. Nakashima, H. Hojo, R. Minami, Y. Yamaguchi, M. Yoshikawa, H. Akao, T. Watanabe, and W. Horton,
Flute Modes and Transport in a Magnetic Divertor of an Open System,
J. Plasma Fusion Res. vol. 84, 279-292, (2008).

W. Horton, J.-H. Kim, F. Miletello, M. Ottaviani, *Turbulent impulsive magnetic energy release from electron scale reconnection,* Physics of Plasmas, Volume 14,pp 012902, (2007). doi/10.1063/1.2424555

X.R. Fu, W. Horton, Y. Xiao, Z. Lin, A.K. Sen and V. Sokolov, "Validation of electron Temperature gradient turbulence in the Columbia Linear Machine, Phys. Plasmas **19**, 032303 (2012).

PhD student worked on the project and received PhD in ? 2011

Xiangrong Fu, "Turbulent Particle and Thermal Transport in Magnetized Plasmas", May 2012. Post-doctoral Position, Los Alamos Scientific Laboratory

The SciDAC project at the IFS advanced the state of high performance computing for turbulent structures and turbulent transport. The team project with Prof Zhihong Lin [PI] at Univ California Irvine produced new understanding of the turbulent electron transport. The simulations were performed at the Texas Advanced Computer Center TACC and the NERSC facility by Wendell Horton, Lee Leonard and the IFS Graduate Students working in that group. The research included a Validation of the electron turbulent transport code using the data from a steady state university

experiment at the University of Columbia in which detailed probe measurements of the turbulence in steady state were used for wide range of temperature gradients to compare with the simulation data. These results were published in a joint paper with Texas graduate student Dr. Xiangrong Fu using the work[1] in his PhD dissertation.

[1] X.R. Fu, W. Horton, Y. Xiao, Z. Lin, A.K. Sen and V. Sokolov, "Validation of electron Temperature gradient turbulence in the Columbia Linear Machine, Phys. Plasmas **19**, 032303 (2012).