

Abstract Submitted
for the DPP10 Meeting of
The American Physical Society

Overview of the Simulation of Wave Interactions with MHD Project (SWIM)¹ DONALD BATCHELOR², ORNL — The SWIM center has the scientific objectives of: improving our understanding of interactions that both RF wave and particle sources have on extended-MHD phenomena, improving our capability for predicting and optimizing the performance of burning plasmas, developing an integrated computational system for treating multi-physics phenomena with the required flexibility and extensibility to serve as a prototype for the Fusion Simulation Project, addressing mathematics issues related to the multi-scale, coupled physics of RF waves and extended MHD, and optimizing the integrated system on high performance computers. Our Center has now built an end-to-end computational system that allows existing physics codes to be able to function together in a parallel environment and connects them to utility software components and data management systems. We have used this framework to couple together state-of-the-art fusion energy codes to produce a unique and world-class simulation capability. A physicist's overview of the Integrated Plasma Simulator (IPS) will be given and applications described. For example the IPS is being employed to support ITER with operational scenario studies.

¹Work supported by U.S. DOE under Contract DE-AC05-00OR22725 with UT-Battelle, LLC.

²for the SWIM Team

Donald Batchelor
ORNL

Date submitted: 19 Jul 2010

Electronic form version 1.4