Abstract Submitted for the 50th Annual Meeting
Division of Plasma Physics
November 17-21, 2008, Dallas, Texas

Category Number and Subject: 5.6.2 DIII-D Tokamak

[ ] Theory [X] Experiment

Development of an IMFIT Fast-Ion Physics Module and Study of Low-Frequency Sound-Wave Gap Structure,* W. Guo, *ASIPP*, M.S. Chu, L.L. Lao, H.E. St. John, G. Abla, M. Choi, A.D. Turnbull, M.A. Van Zeeland, *GA*, Y.M. Jeon, *ORISE*, J.M. Park, *ORNL*, G.Q. Li, Q. Ren, *ASIPP* — A predictive understanding of fast-ion transport and stability is essential for burning plasma experiments. Recently, much lower frequency fast-ion instabilities in the sound-wave frequency range were observed in several tokamaks. The CONT code that has been extensively applied for investigation of Alfven frequency gap structure is being enhanced to study these lower frequency acoustic-wave gap structures. An equilibrium database with various plasma geometry, pressure, and current profiles is being compiled for this study. To facilitate the study of fast-ion transport and stability, a fast-ion physics module is being developed for integration into the Integrated Modeling and Fitting (IMFIT) tool. IMFIT provides a convenient platform for interactions among various fast-ion physics codes such as CONT, NUBEAM, ORBIT-RF, and NOVA-K and testing of fast-ion transport and stability theory against experimental observations. Details will be presented.

*Work supported by US DOE under DE-FG03-95ER54309, DE-FC02-04ER54698, DE-AC05-06OR23100, and DE-AC05-00OR22725.