Simulations of DIII-D Discharges With Impurity Seeding

J. MANDREKAS, W.M. STACEY, Georgia Institute of Technology, M. MURAKAMI, M.R. WADE, Oak Ridge National Laboratory, G.L. JACKSON, W.P. WEST, General Atomics — Coupled main plasma and multi-charge state impurity transport simulations are performed for a number of recent L-mode DIII-D discharges with injection of noble gas impurities (Ne, Ar and Kr). Plasma transport is described by an L-mode Bohm transport model, and the observed confinement improvement following the impurity injection is modeled by reducing the multiplier in each transport channel as well as by employing theory-based rotation and magnetic shear correction factors. The transport of the impurity charge states is described by a simple fixed-shape model as well as by neoclassical theory. The effect of the particle pinch on the plasma and impurity core concentrations in the magnetic field and $q_{95}$ scan discharges is also discussed.

Supported in part by US DOE Contracts DE-AC03-99ER54463 and DE-AC05-00OR22725.