Abstract Submitted
for the DPP08 Meeting of
The American Physical Society

Fullwave Simulation of Doppler Reflectometry in Turbulent Plasmas CARSTEN LECHTE, ULRICH STROTH, Institut fuer Plasmaforschung, Universitaet Stuttgart, Germany, GARRARD CONWAY, Max-Planck-Institut fuer Plasmaphysik, EURATOM Assoziation — Doppler reflectometry is a microwave diagnostic for plasma density fluctuations and flow velocities. In a fusion plasma, the radial electric field can then be estimated from the poloidal plasma velocity. In the presence of strong density fluctuations, the response from the plasma is dominated by dispersion and multiple scattering, and hence becomes non-linear. Quantitative investigations are then only possible with 2D or 3D simulations of the wave propagation using the Maxwell equations and the electron equations of motion. IPF-FD3D is the finite difference time domain code used to investigate the dependence of the scattering efficiency from the various plasma conditions. First results in slab geometry indicate a strong dependence on the density gradient, the turbulent fluctuation strength, and the wave polarisation. In addition, the actual plasma conditions in ASDEX-Upgrade are recreated in the simulation in order to interpret experimental measurements. These investigations will help achieve the main physics goal of determining the absolute density fluctuation wavenumber spectrum of the plasma.

Carsten Lechte
Institut fuer Plasmaforschung, Universitaet Stuttgart, Germany

Date submitted: 17 Jul 2008 Electronic form version 1.4