Abstract Submitted
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Comparison of NSTX FIDA, Charge Exchange, and Neutron Fluxes with Calculated Signals Based on CQL3D-FOW Distribution Functions[1] R.W. HARVEY, YU.V. PETROV, J.E. KINSEY, CompX, D. LIU, W.W. HEIDBRINK, UC Irvine, G. TAYLOR, Princeton Plasma Physics Lab, P.T. BONOLI, Mass. Inst. of Technology — Ion distribution function calculations with CQL3D [1] have been substantially advanced through implementation of guiding-center-orbit-based Fokker-Planck Coefficients [2]. The resulting finite-orbit-width (FOW) calculations are carried out with a fast CQL3D-Hybrid-FOW option, and in a slower but neoclassically complete (except no Er yet) CQL3D-FOW option. Good comparison between time-dependent Fast Ion Diagnostic FIDA [3], NPA, and neutron signals resulting from neutral beaminjection(NBI) and high harmonic fast wave (HHFW) power injected into the NSTX spherical tokamak have been simulated with the CQL3D-Hybrid-FOW, using only the FOW effects on QL diffusion, and particle losses, direct and CX. Comparisons are also made with recent CQL3D-FOW results [2], as well as between the original FIDA calculation code [3,4] and a recent fortran version [5].
[1] R.W. Harvey and M. McCoy, "The CQL3D Fokker Planck Code," http://www.compxco.com/cql3d.html. [2] Yu.V. Petrov and R.W. Harvey, this meeting (2014). [3] W. W. Heidbrink, et al. Plasma Phys. Controlled Fusion, 1855 (2004).Comm. Comp. Phys., 716 (2011). [4] D. Liu, W.W. Heidbrink, et al., Pl. Phys. Contr. Fusion, 025006 (2010). [5] Geiger, Benedikt, See https://github.com/D3DEnergetic/FIDASIM.

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