Abstract Submitted
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Development of the Finite Orbit Width version of the CQL3D code[1] YURI PETROV, BOB HARVEY, CompX — Further improvements for the Full Finite-Orbit-Width (FOW) version of the finite-difference CQL3D bounce-averaged Fokker-Planck (FP) code [1] have been made. This version adds neoclassical radial transport features into the FP coding, in contrast to the simplified Hybrid-FOW version. We emphasize that the Full-FOW version includes nonthermal and full-orbit, not small-orbit first order correction, neoclassical theory. The collision coefficients are averaged along guiding center orbits, with a proper transformation matrix from local coordinates to the midplane coordinates, where the FP equation is solved. All radial terms are included. The computation of the collision operator is parallelized in velocity-grid index, typically using 128 CPU cores, resulting in run times about 1-2 hours. Tests are performed for NSTX conditions with NBI heating. Comparison is done between the Full-FOW, Hybrid-FOW, and Zero-Orbit-Width models.

[1] R.W. Harvey and M. McCoy, "The CQL3D Fokker Planck Code," www.compxco.com/cql3d

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