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CQL3D Time-Dependent Runaway Electron Discharge Dynamics, Including Self-Consistent Ampere-Faraday Equation, Radial Transport, and RF QL Diffusion[1] YURI PETROV, R. W. HARVEY, CompX, P. B. PARKS, General Atomics — CQL3D [1,2] provides a relativistic, finite-difference, bounce-averaged Fokker-Planck solution for the electron distribution $f(\mathrm{v}_0,\mathrm{theta}_0,\mathrm{rho}_0,\mathrm{t})$ under the influence of density/temperature variations induced, in this case, by a parameterized model for impurity stream from gas or pellet injection simulating plasma disruption or RE mitigation, and the toroidal electric field. For CQL3D, 6D phase-space is reduced to 3D by averaging over gyro-phase, bounce-phase, and toroidal angle in toroidal axisymmetric geometry. The solution is found self-consistently with the time-dependent Ampere-Faraday equations. We vary parameters controlling the amount and velocity of the impurity source, the rate of $\mathrm{T_e}$-reduction, and the lowest $\mathrm{T_e}$ achieved, in order to clarify the role of these parameters for RE minimization. Effects of RF wave injection and internal excitation are considered, as a mechanism for enhanced pitch-angle scattering of electrons. [1] R.W. Harvey and M.G. McCoy, "The CQL3D Fokker Planck Code," www.compxco.com/cql3d.html. [2] R.W. Harvey, V.S. Chan, S.C. Chiu et al., Phys. Plasmas 7, 4590 (2000).

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