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Toroidal Ampere-Faraday Equations Solved Consistently with the CQL3D Fokker-Planck Time-Evolution[1] R.W. HARVEY, YU.V. PETROV, CompX — A self-consistent, time-dependent toroidal electric field calculation is a key feature of a complete 3D Fokker-Planck kinetic distribution radial transport code for f(v,theta,rho,t). In the present CQL3D finite-difference model, the electric field E(rho,t) is either prescribed, or iteratively adjusted to obtain prescribed toroidal or parallel currents. We discuss first results of an implementation of the Ampere-Faraday equation for the self-consistent toroidal electric field, as applied to the runaway electron production in tokamaks due to rapid reduction of the plasma temperature as occurs in a plasma disruption. Our previous results assuming a constant current density (Lenz' Law) model [1] showed that prompt "hot-tail runaways" dominated "knock-on" and Dreicer "drizzle" runaways; we will examine modifications due to the more complete Ampere-Faraday solution..

[1] R.W. Harvey et al., Physics of Plasmas 7, 4590 (2000).

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