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Novel Numerical Solution to the Plasma Kinetic Equation JOSEPH SPENCER, ERIC HELD, JEONG-YOUNG JI, Utah State University, NIMROD Team — One way to characterize plasmas is in terms of fluid moments such as density, flow velocity and temperature for each species. These moments can be computed simply from a single function defined over velocity space called the distribution function. Directly solving the plasma kinetic equation, which governs the time evolution of the distribution function, is a difficult task, however, even on massively parallel computers. One primary difficultly lies in developing an efficient treatment of the nonlinear Coulomb collision operator. Computer codes which use numerical methods to solve this kind of problem are called Fokker-Planck codes. In this poster, we describe preliminary development of a general Fokker-Planck code that uses a combination of finite-element(FE)/Fourier representation of velocity space. For magnetized plasmas, it is anticipated that the Fourier expansion in the gyro-angle coordinate will converge rapidly. This assumption, as well as the convergence properties of the FE representation will be discussed in relation to the simple problem of a beam of particles slowing down off a background, Maxwellian plasma.

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