Comparison of Monte Carlo simulations with analytic collision model[1] E. DAY-ROBERTS, M.R. BROWN, T. GRAY, Swarthmore College, V.S. LUKIN, Naval Research Laboratory — We test a Monte Carlo simulation of particle collisions based on a model by Takizuka and Abe [JCP 25, 205, (1977)]. This model is included in the Hamiltonian particle pushing code (PPC) for simulating particle orbits in the Swarthmore Spheromak eXperiment (SSX) MHD wind tunnel. The simulated dynamics, with collisions, are compared with analytical transport equations for slowing down, diffusion, and energy loss. Preliminary results show general agreement with the analytic model. The Takizuka collision model performs binary collisions between the test particle and a field particle drawn from a stationary Maxwellian background distribution of ions. The time difference between collisions is dependent on the current plasma parameters. Realistic particle dynamics in simulated SSX wind tunnel fields will be presented if available.

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