

Abstract Submitted
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Coulomb Collision Algorithms for Particle Codes¹ BRUCE COHEN, Univ. Calif. Lawrence Livermore Nat. Lab. — This paper surveys some of the particle code algorithms used to model Coulomb collisions in fully ionized plasmas, e.g., pair-wise operators such as the Takizuka-Abe¹ scheme and extensions², Langevin equation collision operators^{3,4}, and partially linearized gyrokinetic collisions operators for strongly magnetized plasmas.^{5,6,7} Some recent experience is reported.⁸ Issues such as physics completeness, accuracy, and comparative algorithm performance are highlighted. 1. T. Takizuka and H. Abe, *J. Comput. Phys.* **25**, 205 (1977). 2. K. Nanbu, *Phys. Rev. E* **55**, 4642 (1997). 3. M.E. Jones, et al., *J. Comp. Phys.* **123**, 169 (1996). 4. W.M. Manheimer, M. Lampe, and G. Joyce, et al., *J. Comp. Phys.* **138**, 565 (1997). 5. X.Q. Xu and M.N. Rosenbluth, *Phys. Fluids B* **3**, 627 (1991). 6. A.M. Dimits and B.I. Cohen, *Phys. Rev. E* **49**, 709 (1994). 7. Z. Lin, W. M. Tang, and W. W. Lee, *Phys. Plasmas* **2**, 2975 (August 1995). 8. B.I. Cohen, et al., “Effects of ion-ion collisions and inhomogeneity in two-dimensional kinetic ion simulations of stimulated Brillouin backscattering,” accepted for publication in *Phys. Plasmas* (2006).

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