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Exact energy conservation in hybrid meshless model/code[1]
SERGEI A. GALKIN, Far-Tech, Inc. — Energy conservation is an important issue for both PIC and hybrid models. In hybrid codes the ions are treated kinetically and the electrons are described as a massless charge-neutralizing fluid. Our recently developed Particle-In-Cloud-Of-Points (PICOP) approach [1], which uses an adaptive meshless technique to compute electromagnetic fields on a cloud of computational points, is applied to a hybrid model. An exact energy conservation numerical scheme, which describes the interaction between geometrical space, where the electromagnetic fields are computed, and particle/velocity space, is presented. Having being utilized in a new PICOP hybrid code, the algorithm had demonstrated accurate energy conservation in the numerical simulation of two counter streaming plasma beams instability. [1] S. A. Galkin, B. P. Cluggish, J. S. Kim, S. Yu. Medvedev "Advansed PICOP Algorithm with Adaptive Meshless Field Solver", Published in the IEEE PPPS/ICOP 2007 Conference proceedings, pp. 1445-1448, Albuquerque, New Mexico, June 17-22, 2007.

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