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Relativistic radiation damping for simulation AMODSEN CHOTIA, JOHN VERBONCOEUR, Plasma Theory and Simulation Group, University of California at Berkeley — The aim of this work is to implement radiation braking into a simulation code. Radiation physics of accelerated charges is not new. It dates from the end of the 19th century, from Maxwell theory and Larmor, Poynting, Thomson, Poincare, Lorentz, Von Laue, Abraham, Schott, Planck, Landau, Einstein, Dirac, Wheeler et Feynmann (and many others). The result reaches out from the length of life of exited levels of atoms, antennas, and lays out through specific production of radiation by bremsstrahlung in particles accelerators but also spatial and stellar astrophysics. In this work we start from Landau Lifchitz equation to express the quadrivector acceleration in term of the fields. Using a result from Pomeranchouck we deduce the energy lost by radiation. We do an instantaneous colinear projection of the velocity vector in order to substract the loss of kinetic energy due to radiation. The equation of motion is then solved based on Boris algorithm. The code is tested on few examples.

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