Relativistic radiation damping for simulation AMODSEN CHOTIA,
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ifornia 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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