



Contribution ID: 6

Type: **not specified**

Space Charge Tracking in Accelerators (12'+3')

Tuesday 16 October 2018 14:45 (15 minutes)

The interactions between charged particles are derived from the relativistic Lienard-Wiechert four-potential. This expression is usually broken into field components and solved statically (Coulombic). However, to study high-intensity, high-precision beams, one can simulate bunch dynamics by incorporating the full potential into a Lorentz-covariant Hamiltonian.

Methods are shown for building an explicit (requiring no solvers), symplectic (ensuring long-term stability) integrator from such a Hamiltonian. A method is also shown which places particles on an extruded Archimedian-spiral coordinate system, which can reduce the number of calculation steps needed versus the typical rectilinear-mesh approach.

Author: Mr FOLSOM, Benjamin (European Spallation Source; Lund University)

Presenter: Mr FOLSOM, Benjamin (European Spallation Source; Lund University)

Session Classification: Partikeldagarna 2018