

APR13-2013-020125

Abstract for an Invited Paper
for the APR13 Meeting of
the American Physical Society

Doctoral Thesis Research in Beam Physics Award Talk: High Energy Ion Cooling from Microbunched Electrons
DANIEL RATNER, SLAC National Accelerator Laboratory

Electron and stochastic cooling are proven methods for cooling low energy hadron beams, but at present there is no way of cooling hadrons as they near the TeV scale (e.g. at the Large Hadron Collider). In the 1980s, Derbenev suggested that electron instabilities could create space charge fields strong enough to cool ions. More recently Derbenev and Litvinenko worked out a scheme using a Free Electron Laser as the amplifying medium. In this talk I will present an alternative approach to electron cooling using the microbunching instability as the amplifier, and will show an example using parameters from the Large Hadron Collider.