



Contribution ID: 92

Type: **not specified**

Suppression of the Fast Beam-Ion Instability by Tune Spread in the Electron Beam due to Beam-Beam Effects

Tuesday 24 September 2019 17:50 (20 minutes)

The fast beam-ion instability (FII) is caused by the interaction of an electron bunch train with the residual gas ions. The ion oscillations in the potential well of the electron beam have an inherent frequency spread due to the nonlinear profile of the potential. However, this frequency spread and associated with it Landau damping typically is not strong enough to suppress the instability. In this work, we develop a model of FII which takes into account the betatron frequency spread in the electron beam due to the beam-beam interaction in an electron-ion collider. We show that with a large enough beam-beam parameter the fast ion instability can be suppressed. We estimate the strength of this effect for the parameters of the eRHIC electron-ion collider.

Author: STUPAKOV, Gennady (SLAC National Accelerator Laboratory (US))

Presenter: STUPAKOV, Gennady (SLAC National Accelerator Laboratory (US))

Session Classification: Session 3