

**Beam-Beam Instability in Presence of Beam Cooling, Y.K. BATYGIN, RIKEN; T. KATAYAMA,** University of Tokyo - Among variety of planning experiments at future RIKEN Radioactive Isotope Beam Factory the ion-ion merging collisions and head-on interaction of electron beam with unstable ion beams are of the most importance. Luminosity is proportional to beam-beam parameter, which does not exceed the small value of 0.005 in existing hadron colliders. Implementation of ion beam cooling is expected to be a way to suppress beam-beam instability and to enlarge the maximum achieved value of beam-beam parameter. In this case luminosity can be increased several times as compare with that without cooling. Analytical and numerical treatment of beam-beam interaction in presence of beam cooling is given.