

**Merging Beam-Beam Collisions at Radioactive Isotope Beam Factory, Y. BATYGIN, RIKEN; T. KATAYAMA, INS, University of Tokyo** - Merging ion-ion interaction is an important feature of the proposed RIKEN Radioactive Isotope Beam Factory. In the merging collision case, the value of luminosity  $10^{26}$  1/cm<sup>2</sup>sec is several orders of magnitude less than for head-on collisions because both beams have almost the same vector of velocity and merging angle is rather small (1-10\_) even when the stored number of ions is close to the space charge limit of  $10^{12}$  particles. In the present paper, the beam-beam effects are studied for merging beam collisions using particle-in-cell (PIC) model in multidimensional phase space. Tolerable incoherent beam-beam tune shift and beam disruption effect such as emittance growth have been evaluated from high order nonlinear resonances study. Beam luminosity and beam life time due to beam-beam effects are estimated as a function of main collider parameters.