

New Physics and Improvements in Beam-Beam Tail Simulations*, T. CHEN, J. IRWIN, R.H. SIEMANN, SLAC - High Order Horizontal Resonances (e.g. 8th to 16th) are found to be exceptionally strong in the horizontal tail excited by the beam-beam interaction. The effect of the resonances on lifetime is observed by beam-beam tail simulation. The first order perturbation calculation gives good agreement with simulation on resonance width and tune. New features have been added to the beam-beam tail simulation program. One is the gas scattering. The simulated lifetime result is compared with analytical calculation and agrees well. The other effect studied by the simulation program is parasitic crossing in PEP-II. The simulation demonstrates a sudden tail blow-up by the parasitic crossing when the horizontal separation is reduced to about 7σ . More interference between lattice nonlinearities, such as dynamic aperture, and beam-beam interaction is studied.

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