

Coherent Mode Analysis of High Intensity Beams in Synchrotrons, S. MACHIDA, KEK - As F. Sacherer studied long time ago, a resonance crossing of incoherent tune which is depressed by space charge effects does not directly cause emittance growth nor impose the intensity limit on a synchrotron. By employing a multi-particle tracking simulation, we have looked at coherent modes of a whole beam; not only an envelope mode (that is a quadrupole mode, which Sacherer studied in detail) but also other modes such as sextupole and octupole ones in 2- or 3-dimensional space. Those mode analyses show that a crossing of depressed coherent modes at the resonance of the same order, which is excited by lattice field errors, could be a source of emittance growth and beam loss.