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Transit Time Simulation Studies

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In this talk, we investigate the transit time of particles in a third-integer resonant extraction process. Transit time is defined as the number of turns a particle takes to get extracted once it is in the unstable region, i.e., outside the triangular separatrix. The study of transit time is important because transit time determines the beam response time during resonant extraction and thus knowing it aprori could be practically useful in designing a resonant extraction system. We shall review and borrow a few important results from the first-order Kobayashi Hamiltonian formalism that would aid us in the transit time studies of particles during the extraction process. Here we investigate the transit time of particles in different parts of the phase space distribution and compare against the analytical results. We also compare the simulation result of the transit time of particles (with higher statistics) for the static as well as dynamic extraction conditions cases, particularly in the context of resonant extraction parameters for Mu2e experiment at Fermilab.

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