

Effects of the Spatial Extent of Multiple Cyclotron Harmonic Layers*

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An analytic model for single particle motion in the presence of a wave field and multiple cyclotron harmonics is developed and investigated. The model suggests that even in the absence of Doppler broadening, cyclotron harmonic layers have finite spatial extent. This allows for particles to interact with more than one harmonic layer simultaneously, provided the layers are tightly packed. The latter phenomenon is investigated in the context of the model using symplectic mapping techniques. Then the model behavior is compared with numerical simulations of neutral beam particle trajectories in NSTX using the full-orbit code SPIRAL.

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