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Autoresonant transition in the presence of noise and self-fields¹

IDO BARTH, Hebrew University of Jerusalem — A sharp threshold on the driving amplitude for transition to adiabatic nonlinear phase-locking (autoresonance) is characteristic of a single, electrostatically trapped particle starting in equilibrium and driven by a chirped frequency perturbation. In the presence of a weak noise or a small temperature (T) initial distribution of trapped particles, the threshold develops a width, scaling as $T^{1/2}$. The inclusion of repulsive self-fields makes the width of the autoresonant transition narrower.

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