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Low Frequency Perturbations, Adiabatic Ground States and Wave Function Collapse SAMUEL P. BOWEN, Chicago State University, JAY D. MANCINI, Kingsborough College of CUNY, VASSILIOS FESSATIDIS, Fordham University — It is a well known and established fact that Time Dependent Perturbation Theory (TDPT) predicts that non-resonant time dependent perturbations will provoke no change in the excited state probability amplitudes of quantum systems. In this work we study a number of quantum systems wherein, at low frequencies, a response is indeed generated (by non-resonant perturbations) causing the system to respond adiabatically and hence resulting in the creation of instantaneous (time-dependent) ground states. These instantaneous time-dependent ground states are a linear combination of both the ground state and the excited states. The wave-function collapse of these adiabatic ground states calls into question the common wisdom that off-resonant perturbations can have no effect on quantum systems.

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