Energy Eigenstates in Systems Weakly Coupled to Environments: Decoherence to Pointer States

WENGE WANG, Dept. of Phys., NUS, Singapore — We study decoherence of superpositions of energy eigenstates in a generic system with nondegenerate discrete spectrum, which is quite weakly coupled to a generic environment. We show that $t_e \gg \tau_f$ in most cases, where $t_e$ is the time before which energy eigenstates are robust and $\tau_f$ is a time scale related to decoherence of superpositions of energy eigenstates. Energy eigenstates are shown to be pointer states between the two time scales.