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**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.

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