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Quantum Dynamics of Nonlinear Oscillators[1] BRAD TREES, Ohio Wesleyan University, ELIZABETH SEGELKEN, Kenyon College — Motivated by an analogy to Josephson junctions, we studied the dynamics of a damped, driven pendulum in the quantum limit. We model the effects of damping by means of the quantum state diffusion method, in which the Hamiltonian in Schrödinger's equation is augmented by terms constructed from combinations of Lindblad operators. The dynamics were observed by looking at the time dependence of the expectation values of the pendulum's angular momentum and mechanical energy. We present our results. The next step is to couple two damped, driven quantum pendula and search for evidence of synchronization. This would suggest that it is possible to synchronize coupled small-area Josephson junctions, which must be treated in the quantum limit.

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