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Harnessing a Dynamical Bifurcation for a High Fidelity, Dispersive Qubit Readout¹

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A dynamical bifurcation, if sufficiently well controlled, can sensitively amplify quantum signals. We have successfully implemented this principle in a microwave driven anharmonic Josephson oscillator. I will present measurements on the Josephson bifurcation amplifier (JBA) as a controlled, projective readout for a superconducting Quantonium qubit. The JBA also lays the groundwork for a quantum “erasure” experiment with macroscopic tunnel junction circuits, and is thus a route for a novel test of the foundations of quantum mechanics.

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