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Microwave Activation of a Current-Biased Josephson Junction Near the Classical-Quantum Crossover ZECHARIAH THRAILKILL, JOSEPH LAMBERT, STEVEN CARABELLO, THILANKA GALWADUGE, ROBERTO RAMOS, Drexel University — We examine the microwave activation of a current-biased Josephson junction near the crossover temperature $T_{cr} = hf/2\pi k_b$ in order to show how the device transitions from the classical regime to the quantum regime. We use microwaves to probe the quantum energy states that exist in the potential well. The quantum features, in the form of peaks in escape rate enhancements, are visible until the junction is heated up to the crossover temperature, at which point the line widths of the energy levels overlap and become indistinguishable from one another. The result is a step-like structure that is characteristic of escape rate enhancements in the classical regime. Well above this temperature, the junction behaves classically when resonantly activated with microwaves.

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