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Construction of Detection Electronics to Assess Superconducting-to-Normal Switching Events in a Josephson Junction[1] DAN FAUNI, GIANNA CALLIGY, KEERAN RAMANATHAN, ROBERTO RAMOS, University of the Sciences — Wide interest in superconductor-based quantum computing motivates our investigation of one of the mechanisms driving the readout of the quantum state of a Josephson junction. Escape of a Josephson phase particle from the zero-voltage state of a current-biased, hysteretic Josephson junction has been studied experimentally, in agreement with Kramers theory for the escape of a Brownian particle from a potential well. The effect has been investigated in devices made from single-gap superconductors such as Al and Nb, high-Tc superconductors, and multi-gap superconductors such as MgB2[1]. We discuss the progress we made in building electronics that allow physics undergraduates to perform similar experiments using a 2 Kelvin cryocooler, potentially on multi-gap superconductors. The detection electronics consists of a current ramp bias circuit, a universal time interval counter measuring switching statistics, and a Schmidt trigger detection circuit that amplifies and measures switching of voltages of a Josephson junction. This work is being performed by a team of undergraduates. [1] S. Carabello, et al., J. Appl. Phys. 120, 123904 (2016)

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