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Fluxon dynamics in a Josephson junction parallel array[1] NIKHIL FERNANDES, KENNETH SEGALL, USHNISH RAY, Colgate University, ADAM DIOGUARDI, University of California at Davis — We present experimental measurements on the dynamics of fluxons in an array of Josephson junctions. Fluxons trapped in a parallel array of Josephson junctions upon cooldown experience a potential determined by the junction critical currents and the cell inductances. We probe the dynamics of the fluxon with switching current measurements, which allow determination of the transition rate of the fluxon from its pinned state to a running state. The transition to the running state is initiated by thermal activation at temperatures higher than the quantum crossover temperature for the junctions. Below the crossover, we observe an abrupt change in the critical force needed to move the fluxon. Quantum tunneling of the fluxons is a possible explanation for this observation. We present the data, numerical simulations, and a discussion of the results.

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