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Underdamped fluxon diffusion in a Josephson junction parallel array KENNETH SEGALL, Colgate University, JUAN MAZO, University of Zaragoza, ADAM DIOGUARDI, UC Davis, NIKHIL FERNANDES, Colgate University — We present experimental measurements and numerical simulations on the dynamics of fluxons in a parallel array of Josephson junctions. Fluxons trapped in a parallel array of Josephson junctions upon cooldown experience a periodic potential determined by the junction critical currents and the cell inductances. As shown in two recent papers [1,2], under certain conditions fluxons can move through the array in a series of noise-induced phase slips. This leads to a low-voltage diffusion branch in the current-voltage characteristics, similar to that in underdamped phase diffusion for a single junction. Unlike underdamped phase diffusion, however, this fluxon diffusion does not need frequency-dependent damping to occur. We demonstrate the existence of this state by direct measurements of the current-voltage characteristics and measurements of the switching current distribution of the array. 1. J.J. Mazo et al. Phys. Rev. B78, 174510 (2008) 2. K. Segall et al. http://arXiv.org/abs/0807.2978, to appear in J. Low Temp. Phys.

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