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Flux Creep associated with Strong Pinning in Isovalently Doped Iron-Based Superconductors M. KONCZYKOWSKI, SULTAN DEMIRDIS, C.J. VAN DER BEEK, Laboratoire des Solides Irradies, Ecole Polytechnique, CNRS UMR 7642 & CEA/DSM/IRAMIS, 91128 PALAISEAU, France, R. PROZOROV, M. TANATAR, P.C. CANFIELD, Ames Laboratory, Ames, IA 50011, U.S.A., S. KASAHARA, T. SHIBAUCHI, YUJI MATSUDA, Department of Physics, Kyoto University, Kyoto 606-8502, Japan — Strong pinning in Iron-Based Superconductors leads to the ubiquitous central peak of the irreversible magnetization. Notably, isovalently doped materials such as $BaFe_2(As_{1-x}P_x)_2$ and $Ba(Fe_{1-x}Ru_x)_2As_2$ offer a paradigm for the study of strong pinning because it is the only contribution to the critical current density j_c. We have studied flux creep rates as function of field and temperature in the low- and high field regimes in which j_c is limited by the line tension of a single pinned vortex, and by vortex interactions, respectively. For $T < \frac{1}{2}T_c$, screening currents j are of the order of 10^9 Am^{-2}, in spite of a creep rate $d\ln j/d\ln t \sim 0.02$. Creep is initially Anderson Kim-like, *i.e.* , creep barriers U depend on j as $U \propto (1 - j/j_c)$ over an order of magnitude in j, before crossing over to a nonlinear behavior. j_c is easily extracted from the high-current, short-time part of the magnetic relaxation. The results cast doubt on the range of applicability of the often-used "interpolation formula" $j \propto [1 + (k_BT/U_c)\ln(t + t_0/\tau)]^{-1/\mu}$ for weak collective pinning.

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