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Scanning SQUID microscopy of SFS π -Josephson junction arrays¹ M.J.A. STOUTIMORE, S.M. FROLOV, D.J. VAN HARLINGEN, University of Illinois at Urbana-Champaign, V.A. OBOZNOV, V.V. BOLGINOV, V.V. RYAZANOV, Institute of Solid State Physics, Chernogolovka, Russia — We use a Scanning SQUID Microscope to image the magnetic flux distribution in arrays of SFS (superconductor-ferromagnet-superconductor) Josephson junctions. The junctions are fabricated with barrier thickness such that they undergo a transition to a π -junction state at a temperature $T_{\pi} \approx 2-4$ K. In arrays with cells that have an odd number of π -junctions, we observe spontaneously generated magnetic flux in zero applied magnetic field. We image both fully-frustrated arrays and arrays with non-uniform frustration created by varying the number of π -junctions in the cells. By monitoring the onset of spontaneous flux as a function of temperature near T_{π} , we estimate the uniformity of the junction critical currents.

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