

Abstract Submitted
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Towards ordered flux flow in A15 superconductor V₃Si at high fields¹ R. KHADKA, A.A. GAPUD, University of South Alabama, A.P. REYES, L. LUMATA, P.L. KUHNS, National High Magnetic Field Laboratory, D.K. CHRISTEN, Oak Ridge National Laboratory — The motion of flux quanta is observed in a high-quality superconducting single crystal of V₃Si with weak pinning and significantly reduced thermal fluctuations due to a critical temperature of less than 17 K. This opens up the possibility of approaching ordered, Bardeen-Stephen flux flow (BSFF). The flux flow resistivity ρ_{ff} associated with dissipative flux motion is observed in V-I curves as a high-current transition to an ohmic curve whose dissipation level is *below* the normal-state level. Details of overcoming technical difficulties of using high currents are described. BSFF is expected to be manifested by a linear dependence of ρ_{ff} on applied field H . Measuring from fields of 6 T up to 20 T, an approach to ohmic curves characteristic of BSFF are clearly distinguishable, along with other interesting features such as the “peak” effect in critical current $J_c(H)$ seen only when the pinning energy density is comparable to the elasticity of the flux medium. This and further data and their interesting ramifications are discussed.

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Albert Gapud
University of South Alabama

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