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Vortex Matter Studies in Iron Arsenide $Sr_2O_3VO_3FeAs$ OSCAR AYALA-VALENZUELA, CALDES, IBS, POSTECH, Department of Physics, Pohang, Korea, MAN-JIN EOM, JONG-MOK OK, JUN-SUNG KIM, POSTECH, Department of Physics, Pohang, Korea, HAN-WOONG YEOM, JEEHOON KIM, CALDES, IBS, POSTECH, Department of Physics, Pohang, Korea — In a high temperature superconductor (HTSC), at finite temperatures, vortices jump from one pinning center to another in response to the driving force of the current. In several cases this flux creep in Fe-based is larger than in cuprates HTSC. Thermal fluctuations in HTSC also produce melting of the vortex lattice and the appearance of vortex liquid phases, characterized by J_c =0, near the critical temperature (T_c). In general, Fe-based superconductors also exhibit large vortex fluctuation effects, in spite of their lower T_c. Liquid phases are observed in many of these compounds; their extension and characteristics are topics of extensive current research. We have explored vortex fluctuation effects in a single-crystal of Sr_2VO_3FeAs by measuring magnetization and its time decay in a SQUID magnetometer. Despite the lower T_c and small anisotropy, we found creep rates even higher than in other HTSC. We also observed wider liquid phases that covers most of the mixed state region in the H-T phase diagram. These unusually strong fluctuations are a consequence of the very large penetration depth λ, which results in Ginzburg numbers (G_i) higher than in cuprates. In the present study we use classical theories developed for cuprates, and compare them with other Fe-based superconductors.

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