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High magnetic field vortex torque magnetometry in SmFeAsO_{0.8}F_{0.2} single crystals LUIS BALICAS, ALEX GUREVICH, YOUNJUNG JO, JAN JAROSZYNSKI, DAVID LARBALESTIER, National High Magnetic Field Laboratory, Florida State University, Tallahassee-FL 32310, USA, R.H. LIU, H. CHEN, XIANHUI H. CHEN, Hefei National Laboratory for Physical Science a Microscale and Department of Physics, University of Science and Technology of China, Hefei, Anhui, N.D. ZHIGADLO, S. KATRYCH, Z. BUKOWSKI, J. KARPINSKI, Laboratory for Solid State Physics, ETH Zürich, CH-8093 Zürich, Switzerland — To probe manifestations of multiband superconductivity in oxypnictides, we measured the angular dependence of magnetic torque $\tau(\theta)$ in the mixed state of SmO_{0.8}F_{0.2}FeAs single crystals as functions of temperature T and high magnetic field H up to 30 T. We show that the effective mass anisotropy parameter γ extracted from $\tau(\theta)$, can be greatly overestimated if the strong paramagnetism of Sm or Fe ions is not properly taken into account. The correctly extracted γ depends on both T and H , saturating at $\gamma \simeq 9$ at lower temperatures. Neither the London penetration depth nor the superfluid density is affected by high fields up to the upper critical field. Our results indicate two strongly-coupled superconducting gaps of nearly equal magnitudes.

Luis Balicas
National High Magnetic Field Laboratory,
Florida State University, Tallahassee-FL 32310, USA

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