

Abstract Submitted  
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**Magnetism of SmFeAsO<sub>1-x</sub>F<sub>x</sub>**<sup>1</sup> YOICHI KAMIHARA, Keio Univ., YASUHIRO KOBAYASHI, SHINJI KITAO, Kyoto Univ., YOSHITAKA YODA, JASRI, MAKOTO SETO, Kyoto Univ., HIDEO HOSONO, Tokyo Institute of Technology, JST TRIP COLLABORATION, JST CREST COLLABORATION — Magnetic properties of superconducting SmFeAsO<sub>1-x</sub>F<sub>x</sub> are demonstrated by <sup>57</sup>Fe Mossbauer spectroscopy (MS) and <sup>149</sup>Sm Nuclear resonant forward scattering (NRFS). Polycrystalline SmFeAsO<sub>1-x</sub>F<sub>x</sub> samples were synthesized using two-step solid state reaction described elsewhere. [New J. Phys. 12, 033005 (2010).] Purity of samples was checked by X-ray diffraction patterns using Cu K-alpha radiation. Resistivity and magnetization measurements, as well as by <sup>57</sup>Fe MS and <sup>149</sup>Sm NRFS spectroscopy, at various temperatures were performed to define superconducting, magnetic ordering temperatures. [Phys. Rev. B 78, 184512 (2008) & J. Phys. Soc. Japan 77, 103706 (2008).] A magnetic phase diagram we have proposed is closer to that by Hess et al [Europhys. Lett. 87, 17005 (2009).]; that is long-range AF ordering of Fe (a static magnetism) does not persist in the superconducting regime. Such a relation between spin dynamics and SC is a common feature among LnFeAsO<sub>1-x</sub>F<sub>x</sub> (Ln = La, Ce, Pr, Nd, and Sm). Our results indicate that the relation between the static magnetism and  $T_c$  of LnFeAsO<sub>1-x</sub>F<sub>x</sub> shows similar topology to that of copper-based high-T<sub>c</sub> superconductors. [Phys. Rev. B 42, 7981 (1990).]

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