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Determination of Spin Polarization Using Fe-Superconductor $SmO_{0.82}F_{0.18}FeAs$ JESSICA GIFFORD, Arizona State Univ, B.B. CHEN, National Laboratory of Solid State Microstructures, Nanjing University, China, JI ZHANG, GEJIAN ZHAO, DONGRIN KIM, Arizona State Univ, D. WU, National Laboratory of Solid State Microstructures, Nanjing University, China, TINGYONG CHEN, Arizona State Univ — In a half-metallic spin-polarized current, spin of conduction electrons are aligned in one direction but electrons pair with opposite spin orientations in a singlet superconductor. Thus a half-metallic current cannot enter into a singlet superconductor, which can be utilized to measure spin polarization of magnetic materials via Andreev reflection spectroscopy (ARS). Since transition temperatures of most conventional superconductors are below 10 K, spin polarization is measured only at low temperatures by ARS. The recently discovered Fe-superconductors can have a transition temperatures close to 60 K, much higher than that of the conventional superconductors. In this work, we utilized a (1111) Fe superconductor $SmO_{0.82}F_{0.18}FeAs$ and Pb to measure the spin polarization of a highly spin-polarized material, $La_{0.67}Sr_{0.33}MnO_3$. The determined spin polarization value using the Fe superconductor is the same as that using Pb, indicating that the Fe superconductor can be utilized to measure spin polarization of magnetic materials. Furthermore, we show that the spin polarization can be measured up to 52 K, the transition temperature of $SmO_{0.82}F_{0.18}FeAs$.

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