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Transport Properties of Ferromagnet-Superconductor Hybrids near the Superconducting Transition Temperature WONBAE BANG, K.D.D. RATHNAYAKA, I.F. LYUKSYUTOV, Department of Physics and Astronomy, Texas A&M University, College Station, Texas 77843, USA, W. TEIZER, Department of Physics and Astronomy, Texas A&M University and WPI-Advanced Institute for Materials Research, Tohoku University, Japan, D.G. NAUGLE, Department of Physics and Astronomy, Texas A&M University, College Station, Texas 77843, USA — We have studied the transport properties of Ferromagnet-Superconductor Hybrids (FSH) near their superconducting transition temperature. The FSH was composed from periodic arrays of nanosized Ni stripes on the top of 100 nm thin Sn films. Electron-Beam Lithography was used to pattern the Sn films and the periodic arrays of Ni nanostripes on SiO_2 substrate. The Sn films and Ni nanostripes were deposited by thermal quench condensation at liquid nitrogen temperature. A thermally evaporated Germanium (Ge) thin film on top of the Sn films served as an insulating barrier between the Sn and Ni structures. We have studied dependence of resistivity and critical current on temperature and magnetic field normal to the film. We have observed strong hysteresis of resistivity and critical current in magnetic field. We have observed an anisotropy in the critical current depending on the current direction being parallel or perpendicular to the Ni nanostripes.

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