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Controlling Superconductivity in Thin Film with an External Array of Magnetic Nanorods 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; WPI-Advanced Institute for Materials Research, Tohoku University, Sendai 980-8577, Japan, D.G. NAUGLE, Department of Physics and Astronomy, Texas A&M University, College Station, Texas 77843, USA — We have fabricated a novel type of magnet-superconductor hybrid: an ordered array of magnetic nanorods on top of a superconducting film which is electrically insulated from the array. We have studied the transport properties of this magnet-superconductor hybrid including the $R(T)$ and $R(H)$ dependences for temperatures $0.96T_C < T < 1.06T_C$ and magnetic fields $H < 700$ Oe (T_C denotes the critical temperature of the hybrid system). We compare these results with those for a superconducting film on top of alumina template with an array of magnetic nanowires.

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