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Observation of an anisotropy-induced antiparallel-parallel switching at the interface of Fe3O4/Mn3O4 superlattice on MgO(011) GUNG CHERN, Physics Department, National Chung Cheng Iniversity, Chia-Yi, Taiwan, Y.C. WANG, Physics Department, National Chung Cheng Iniversity, Chia-Yi, Taiwan, SPIN RESEARCH CENTER TEAM — An anisotropy-induced magnetic phase transition is first time observed from magnetization vs. field measurement in an antiferromagnetic coupled Fe3O4/Mn3O4 superlattice on MgO(011). Relative to a twisted phase transition previously found in isotropic layer systems, the present transition only occurs along the easy axis in the plane. An abrupt increased magnetization associated with the on-set of the transition corresponds to a direct switching of spin from an antiparallel state to a parallel state at the interface. Large magnetic hysteresis associated with the spin switching are observed on H greater than 0 and H smaller than 0 and thus 4 stable magnetization stages exist in the present system. The critical external field provides a direct estimate of the anisotropy energy of the superlattice. Magnetic hysteresis curves measured at various temperatures further provide a quantitative understanding of the interface coupling of Fe3O4/Mn3O4 superlattices.

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