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Atomic model for the exchange bias in Fe/FePt(110) alloy

CHANYONG HWANG, W. KIM, Korea Research Institute of Standards and Science, J.S. PARK, Y.P. LEE, Department of Physics and q-Psi, Hanyang University, S.C. HONG, Department of Physics, Ulsan University — Fe overlayers on top of Pt(110) surface have been studied using STM and SMOKE. Based on our atom-resolved STM data, we have shown the atomic model for the growth of this system. One of the interesting system is the one grown at elevated temperature. In this case, Fe-Pt surface alloy is formed on top of Pt(110) surface. This surface alloy still maintains the lattice constant of Pt substrate and reveals to be an antiferromagnet. In addition to the field cooling upon additional Fe layers, our first principles calculation clear shows the antiferromagnetic order. For the unified picture of the exchange bias phenomena, we need an atomically resolved antiferromagnetic surface and we will present the possible mechanism of this exchange bias in our system.

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