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**Unexpected size and temperature dependence of the magnetic switching field of individual Co nanoislands** D. SANDER, G. RODARY<sup>1</sup>, S. WEDEKIND, H. OKA, C. ETZ, J. KIRSCHNER, Max Planck Institute of Microstructure Physics, Halle, Germany — We present results on the magnetic switching field of individual, nm small Co islands on Cu(111), which we obtained by low temperature spin-polarized STM in magnetic fields. We find that the magnetic switching field of the islands depends on both island size and temperature. A transition from a superparamagnetic to a blocked magnetization state is found with increasing islands size for islands with appr. 800 atoms at 8 K. The maximum switching field reaches 2.2 T for islands with 5000 atoms, and it decreases for larger islands. The switching field of an island decreases with increasing temperature. A quantitative analysis reveals the failure of the Néel-Brown model of thermally assisted magnetization reversal by coherent rotation, which has been successfully applied to similar systems. Our calculations find a spatial variation of the magnetic anisotropy and of the magnetization within a Co island. The implication of the inhomogeneous magnetic properties for the field-induced magnetization reversal is discussed.

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