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Antiferromagnetic exchange coupling measurements on single Co clusters deposited on CoO (111) layers DAMIEN LE ROY, NCMN Lincoln (NE), WOLFGANG WERNSDORFER, CNRS Grenoble, ROBERT MOREL, ARIEL BRENAC, CEA Grenoble, THIERRY CROZES, CNRS Grenoble, LUCIEN NOTIN, CEA Grenoble, DAVID J. SELLMYER, NCMN Lincoln (NE), INAC / SP2M / NM TEAM, INSTITUT NEEL / NANOSCIENCES DEPARTMENT TEAM — We report on single-cluster measurements of exchange anisotropy in cobalt nanoclusters (4 nm) deposited on CoO (111) layers using a microbridge DC superconducting quantum interference device (microSQUID). Recent improvements of microSQUID technique enabled us to perform the first magnetization curves on single nanoclusters. Intrinsic anisotropy is investigated measuring the angular dependence of low-temperature cluster switching field. Co particles exhibit a Stoner-Wohlfarth behaviour. F/AF exchange coupling is investigated on an ideal system in which the ferromagnetic clusters are deposited on single AF domain CoO (111). The coupling induces modification in clusters anisotropy with strong exchange bias. A preferential orientation is observed with a bistable state that is attributed to a structural anisotropy of CoO (111) layers brought to light by X-Ray diffraction. It is shown that the ferromagnet is strongly coupled with the antiferromagnet with a spin-flop configuration.

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