Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

Temperature and size dependence of antiferromagnetism in Mn nanostructures[1] P. SESSI, CNISM–Dipartimento di Fisica, Politecnico di Milano, I-20133 Milano, Italy, N.P. GUISINGER, J.R. GUEST, M. BODE, Argonne National Laboratory, CNISM–DIPARTIMENTO DI FISICA, POLITECNICO DI MILANO, I-20133 MILANO, ITALY TEAM, CENTER FOR NANOSCALE MATERIALS, ARGONNE NATIONAL LABORATORY, ARGONNE, ILLINOIS 60439, USA TEAM — We report on variable-temperature STM investigations of the spontaneous long-range magnetic order of Mn monolayer nanostructures epitaxially grown on stepped W(110). The measurements reveal that the onset of the antiferromagnetic order is closely related to the Mn nanostructure width along the [001] direction, with a decreasing Néel temperature as we move from a 2D toward a quasi-1D system. In contrast, lateral confinement along the $[1\bar{1}0]$ direction seems to play a less important role. The results are discussed in terms of anisotropic exchange coupling and of boundary effects, both potentially stabilizing long-range magnetic order in nanostructures confined in the $[1\bar{1}0]$ direction.

[1]Use of the Center for Nanoscale Materials was supported by the U. S. Department of Energy, Office of Science, Office of Basic Energy Sciences, under Contract No. DE-AC02-06CH11357.

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Date submitted: 16 Nov 2009 Electronic form version 1.4