Abstract Submitted
for the MAR06 Meeting of
The American Physical Society

Self-Assembled Cobalt Nanodots along Al_2O_3 (0001) step edges[1]

JORGE ESPINOSA, DAVID LEDERMAN, Dept of Physics, West Virginia University — Ultrathin films of Co with thicknesses of 0.80 monolayers (ML) and 0.20 ML were grown on Al_2O_3 (0001) via molecular beam epitaxy at room temperature. *In situ* non-contact atomic force microscopy images obtained after annealing the 0.80 ML film in-situ at 400 °C revealed the formation of nano-dots distributed randomly on the sapphire surface with an average diameter of approximately 18 nm and a height of 0.4 nm. The annealing of the 0.20 ML film showed the formation of nanodots with diameters of 16 nm for the film annealed at 500 °C and 28 nm for an annealing temperature of 500 °C. In general, the nanodots increase their sizes with the annealing temperature and they move towards the top of the sapphire step edges, indicating a certain degree of self organization.

[1]This work was supported by the National Science Foundation (CIAM grant # 0502825).

David Lederman
West Virginia University

Date submitted: 06 Dec 2005 Electronic form version 1.4