Abstract Submitted
for the MAR07 Meeting of
The American Physical Society

Magnetic ordering and switching of iron porphyrin molecules on a substrate OLLE ERIKSSON, Department of Physics, Uppsala University, HEIKO WENDE, Inst. fur Experimental Physik, Freie Univ. Berlin, POOJA PANCHMATIA, BIPLAB SANYAL, PETER OPPENEER, Department of Physics, Uppsala University, KLAUS BABERSCHKE, Inst. fur Experimental Physik, Freie Univ. Berlin, THEORY OF MATERIALS COLLABORATION, EXPERIMENTAL PHYSICS COLLABORATION — We have studied the structural ordering and the magnetic coupling of in-situ sublimated Fe-based porphyrin molecules on epitaxially grown Ni and Co films on Cu(100) by means of X-ray absorption spectroscopy and X-ray magnetic circular dichroism at third generation synchrotron radiation facilities, in an experimental study which is combined by density functional theory (DFT). We demonstrate the necessary sensitivity to probe the magnetic properties even for sub-monolayer porphyrin coverages. We show that due to 90 degree superexchange interaction between Fe atoms in the molecules and atoms in the substrate (Co or Ni) the paramagnetic molecules can be made to order ferro magnetically and even have their magnetisation direction switched by a magnetisation reversal of the substrate. Theory is demonstrated to reproduce the experimental observations.

Olle Eriksson
Department of Physics, Uppsala University

Date submitted: 20 Nov 2006 Electronic form version 1.4