Abstract Submitted
for the MAR17 Meeting of
The American Physical Society

Magnetic interactions in Mn assemblies in a GaAs (110) surface. PAUL KOENRAAD, DAVIDE GROSSI, Eindhoven Univ of Tech, FHOKRUL ISLAM, Linnaeus University, REZA MAHANI, KTH, CARLO CANALI, Linnaeus University, MICHAEL FLATTÉ, Univ of Iowa — We have used Scanning Tunneling Microscopy to create and study the electronic properties of dedicated assemblies of magnetic atoms in a semiconductor. We have been able to create pairs, trimers and tretramers of Mn atoms in the surface layer of GaAs. The electronic interaction between the Mn atoms in these structures is found to be highly anisotropic. We observed only for Mn pairs in the [110] direction a magnetic coupling. This observation is in contrast with previous experimental results [1], where substantial Mn-Mn interaction has been reported for pairs in additional directions. Our energy and spatial resolution allowed for a deeper analysis that showed that the influence of the surface on the anisotropic Mn-Mn magnetic interaction is correctly captured in the model presented in [2]. [1] D. Kitchen et al Nature 442, 436-439 (2006) [2] T.O. Strandberg et al, PRB 81, 054401 (2010).

Paul Koenraad
Eindhoven Univ of Tech

Date submitted: 09 Mar 2017 Electronic form version 1.4