

Abstract Submitted
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STM studies of spin-spin interactions between Mn acceptors in p-type GaAs¹ DONGHUN LEE, DAVID R. DAUGHTON, JAY A. GUPTA, The Ohio State University, Department of Physics — We use a custom STM operating in a cryogenic, ultrahigh vacuum environment to study spin-spin interactions in semiconductors at the single-impurity level. By applying a voltage pulse with the STM tip, single magnetic impurities (e.g. Mn) can be substituted for Ga atoms in the first layer of the GaAs(110) surface. It was previously found that pairs of Mn acceptors exhibit an exchange splitting which depends on their separation and crystal orientation [2]. We are developing a capability for spin-polarized STM to better study long range magnetic ordering between pairs and larger clusters of Mn acceptors. To characterize the magnetic orientation of our STM tips, we have prepared samples such as Co/Cu(111) which exhibits out-of-plane magnetization, and Cr(001), which is an antiferromagnet with in-plane magnetic contrast between alternating terraces. <http://www.physics.ohio-state.edu/~jgupta> [2] D. Kitchen et al., Nature 442, 436-439 (2006)

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