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Effect of magnetic field on the local density of states of Mn acceptor magnets in GaAs M.R. K. MAHANI, C.M. CANALI, Linnaeus University, Kalmar, Sweden, A.H. MACDONALD, University of Texas at Austin — Advances in atomic manipulation, real-space imagining and spectroscopic power of STM techniques have recently made it possible to investigate the local electronic properties of a few substitutional Mn impurities inserted in the GaAs surfaces [1]. Theoretical work [2] predicts that the local density of states in the vicinity of the Mn impurities should depend strongly on the direction of the Mn magnetic moment. In contrast, recent STM experiments [3] from several groups find a negligible dependence of the tunneling LDOS on the magnetic field direction for applied fields up to 7 T. Based on tight- binding calculations we interpret these findings by arguing that large LDOS signals require large angle moment rotations, and that the strength of the magnetic field used in present experiments is not strong enough to substantially modify the magnetic anisotropy landscape of Mn impurities near the GaAs surface.

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[2] T. O. Strandberg, C. M. Canali, and A. H. MacDonald, Phys. Rev. B 80, 024425 (2009). [3] P. M. Koenraad, Private Communication.

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