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Does the physics of (Ga,Mn)N differ from (GaMn)As qualitatively or quantitatively? Is valance of Mn impurity 2+ or 3+? RYKY NELSON, Louisiana State University, TOM BERLIJN, University of Florida, WEI KU, Brookhaven National Laboratory, JUANA MORENO, MARK JARRELL, Louisiana State University — (Ga,Mn)N is a promising material for spintronics due to its potential high currie temperature (Tc) [1]. However, unlike for (Ga,Mn)As, some of the experiments on (Ga,Mn)N are still controversial [2,3] on the intrinsic nature of the magnetism. Furthermore, under debate are the spin and charge state of the disordered Mn impurities in (Ga,Mn)N [4,5] and whether its local moments interact via the same exchange mechanism as in (Ga,Mn)As [6,7]. To address these issues we will present ab-initio-based analyses of disorder and correlation via the recently developed Wannier function based methods [8,9]. [1] T. Dietl et al., PRB 63, 195205 (2001) [2] H. Hori et al., Physica B 324, 142 (2002) [3] S. Dhar et al., APL 82, 2077 (2003) [4] A. Titov et al., PRB 72, 115209 (2005) [5] J. I. Hwang et al., PRB 72, 085216 (2005) [6] T. Dietl et al. Science 287, 1019 (2000) [7] K. Sato et al., RMP 82, 1633 (2010) [8] T. Berlijn et al., PRL 106, 077005 (2011) [9] W.-G. Yin et al., PRB 79, 214512 (2009)

Ryky Nelson
Louisiana State University

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