Abstract Submitted
for the MAR11 Meeting of
The American Physical Society

**Effects of Anisotropy in Magnetic Quantum Dots** RAFAL OSZWALDOWSKI, IGOR ZUTIC, University at Buffalo, ANDRE PETUKHOV, South Dakota School of Mines and Technology — Magnetic ordering in semiconductor Quantum Dots (QDs) doped with Mn is mediated by the confined carriers (typically holes), which interact with Mn through exchange interaction. The ordering can be affected by the QD flat shape [1], and, by the resultant anisotropic g-factor of holes [2]. A reduction of the in-plane symmetry of the QD by an external potential may influence the magnetic alignment as well [3]. We study the magnetic ordering at different degrees of anisotropy. The ordering arises in absence of external magnetic field, e.g., through formation of magnetic polarons. A typical number of Mn in a QD is large, so we replace their spins by classical magnetic moments. We emphasize the limit of full isotropy (electrons) and extreme anisotropy (holes in a flat QD). Supported by DOE-BST, ONR, AFOSR, and NSF-ECCS CAREER.

[1] I. R. Sellers, R. Oszwaldowski, et al., Phys. Rev. B **82**, 195320 (2010)
[2] P. Dorozhkin, et al., Phys. Rev. B **68**, 195313 (2003).
[3] R. M. Abolfath, A. G. Petukhov, and I. Zutic, Phys. Rev. Lett. **101**, 207202 (2008)

Rafal Oszwaldowski
University at Buffalo

Date submitted: 20 Dec 2010 Electronic form version 1.4