Abstract Submitted
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**Bias-controlled ferromagnetism in quantum wells with Mn-delta doping** ERIKA DIAS CABRAL, SUNY Buffalo and UERJ, Brazil, RAFAL OSZWALDOWSKI, SUNY Buffalo and N. Copernicus University, Torun, Poland, MARCO BOSELLI, IGOR ZUTIC, SUNY Buffalo, IVAN DA CUNHA LIMA, UERJ, Brazil — Carrier-mediated magnetism in semiconductors shows important and potentially useful differences from magnetism in metals [1] such as light- or bias-controlled ferromagnetism [2-3]. Motivated by experiments reporting in GaAs quantum wells (QWs) with Mn-delta doping higher Curie temperatures ($T_C$) than in bulk (Ga,Mn)As [4], we explore theoretically the feasibility of bias-controlled ferromagnetism in QWs. We calculate self-consistently indirect Mn-Mn exchange interaction [5] and apply a Monte Carlo approach to calculate $T_C$. Our approach allows us to systematically study the effects of quantum confinement and the position of the Mn layer on magnetic ordering and $T_C$, beyond the mean field approximation, which we obtain as the limiting case. We compare our findings with the experimental results and suggest paths towards improved control of ferromagnetism. Supported by CNPq, FAPEMIG, FAPERJ, CAPES, US ONR, and NSF-ECCS Career. [1] I. Zutic et al., Rev. Mod. Phys. 76, 323 (2004). [2] S. Koshihara et al., Phys. Rev. Lett. 78, 4617 (1997). [3] H. Ohno et al., Nature 409, 944 (2000). [4] A. M. Nazmul et al., Phys. Rev. Lett. 95, 017201 (2005). [5] M. A. Boselli et al., Phys. Rev. B 68, 085319 (2003).

Rafal Oszwaldowski

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