Abstract Submitted
for the MAR16 Meeting of
The American Physical Society

Wurtzite Spin-Lasers GAOFENG XU, SUNY Buffalo, PAULO E. FARIA JUNIOR, GUILHERME M. SIPAHI, University of Sao Paulo, Brazil, IGOR ZUTIC, SUNY Buffalo — Lasers in which spin-polarized carriers are injected provide paths to different practical room temperature spintronic devices, not limited to magnetoresistive effects [1]. While theoretical studies of such spin-lasers have focused on zinc-blende semiconductors as their active regions, the first electrically injected carriers at room temperature were recently demonstrated in GaN-based wurtzite semiconductors [2], recognized also for the key role as highly-efficient light emitting diodes [3]. By focusing on a wurtzite quantum well-based spin-laser, we use accurate electronic structure calculations to develop a microscopic description for its lasing properties. We discuss important differences between wurtzite and zinc-blende spin-lasers. [1] P. E. Faria Junior, G. Xu, J. Lee, N. C. Gerhardt, G. M. Sipahi, and I. Zutic, Phys. Rev. B 92, 075311 (2015). [2] J.-Y. Cheng, T.-M.Wond, C.-W. Chang, C.-Y. Dong, and Y.-F. Chen, Nat. Nanotech. 9, 845 (2014); I. Zutic and P. E. Faria Junior, Nat. Nanotech. 9, 750 (2014). [3] S. Nakamura, Rev. Mod. Phys. 87, 1139 (2015).

GAOFENG XU
SUNY Buffalo

Date submitted: 04 Nov 2015 Electronic form version 1.4