

Abstract Submitted  
for the MAR16 Meeting of  
The American Physical Society

**Edge spin accumulation in a two-dimensional electron gas with two subbands**<sup>1</sup> ALEXANDER KHAETSKII, State Univ of NY - Buffalo, J. CARLOS EGUES, Instituto de Fisica de Sao Carlos, Brazil — We have studied the edge spin accumulation in 2D electron gas due to the intrinsic mechanism of spin-orbit interaction for the case of a two-subband structure. This study is strongly motivated by recent experiments [1] which observed the spin accumulation near the edges of a high mobility 2D electron system in a bilayer symmetric GaAs structure in contrast to zero effect in a single-layer configuration. Our theoretical explanation is based on the Rashba-like spin-orbit interaction which arises as a result of the coupling between two subband states of opposite parities in a symmetric quantum well [2]. Following the method developed in [3], we have calculated the edge spin density in a quasi-ballistic regime, and explained the experimental results, in particular, a large magnitude of the edge spin density. We showed that one can easily proceed from the regime of strong spin accumulation to the regime of weak one. It opens up a possibility to construct an interesting new spintronic device. [1]. F. Hernandez et al., Phys. Rev. B **88**, 161305(R) (2013). [2]. E. Bernardes et al., Phys. Rev. Lett. **99**, 076603 (2007). [3]. A. Khaetskii, Phys. Rev. B **89**, 195408 (2014).

<sup>1</sup>Supported by FAPESP (Brazil)

Alexander Khaetskii  
State Univ of NY - Buffalo

Date submitted: 06 Nov 2015

Electronic form version 1.4