

Abstract Submitted  
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**Skyrmion lattices and topological insulators in ordinary noninteracting 2DEGs**<sup>1</sup> JIYONG FU, POLIANA PENTEADO, MARCO O. HACHIYA, J. CARLOS EGUES, IFSC/USP, DANIEL LOSS, University of Basel — Electrons in two-subband quantum wells are subject to an intersubband spin-orbit coupling [1] that can lead to interesting physical phenomena such as a giant intrinsic spin Hall effect [2] and topological insulator behavior [3]. When the competing Rashba and Dresselhaus couplings are considered, we find that skyrmionic excitations are possible in these ordinary non-interacting electron systems [4]. These excitations can be probed/imaged via transient spin grating experiments and Kerr rotation spectroscopy with available experimental techniques [5]. Here we will discuss how topological spin textures and topological insulating behavior can occur in ordinary III-V quantum wells. This opens up the unique possibility to investigate topological phenomena such as the skyrmion Hall effect in garden-variety type III-V system. [1] Bernardes et al. Phys Rev. Lett. **99**, 076603 (2007). [2] Khaetskii and Egues, arXiv:1602.00026. [3] Erlingsson and Egues Phys. Rev. B **91**, 035312 (2015). [4] Fu, Penteado, Hachiya, Loss, and Egues, Phys. Rev. Lett., in press. [5] Koralek et al., Nature **458**, 610 (2009); Walser et al., Nat. Phys. **8**, 757 (2012).

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