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Spin resolved transverse electron focusing in wide leads due to diffuse collimation in InSb/InAlSb two-dimensional electron gases L.F. COHEN, A.M. GILBERTSON, Imperial College, A. KORMÁNYOS, C.J. LAMBERT, Lancaster University, M. FEARN, T. ASHLEY, QinetiQ, S.A. SOLIN, Washington University in St. Louis — Using the transverse electron focusing geometry, we report spin-resolved cyclotron motion in an InSb two-dimensional electron gas (2DEG). A zero field spin spitting¹ causes electrons from different spin subbands to have slightly different cyclotron radii in external field which manifest as a splitting in the first focusing peak.² Traditionally in focusing experiments, electrons are emitted and collected via quantum point contacts that host only a few open channels. We show that spin resolved electron focusing is observable in *wide* leads with many open channels due to diffuse collimation of ballistic electrons emitted into the bulk 2DEG region. The results are compared to a semiclassical model³ from which a Rashba-type spin-orbit coupling parameter of $\alpha = 5 \times 10^{-11}$ eVm is deduced at 2 K. We compare these results to values determined from the beating of Shubnikov-de Haas oscillations.⁴ We also present ballistic transport results extending over 3 μm .¹A. M. Gilbertson, et al., Phys. Rev. B 77, 165335 (2008). ²L. P. Rokhinson, et al., Phys. Rev. Letts. 93, 146601 (2004). ³A. Kormanyos, Phys. Rev. B 82, 155316 (2010). ⁴A. M. Gilbertson, et al., Phys. Rev. B 79, 235333 (2009).

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