

Abstract Submitted
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Magneto-transport in high mobility n -InSb/InAlSb quantum wells¹ W.R. BRANFORD, A.M. GILBERTSON, Imperial College, L.F. COHEN, M. FEARN, P.D. BUCKLE, L. BUCKLE, QinetiQ Malvern — The inherent large spin-orbit (SO) coupling InSb quantum wells (QWs) is expected to result in sensitive tunability of the Rashba effect with electric field. The strength of the SO coupling can be extracted from measurements of weak anti-localisation (WAL) and from the beating of Shubnikov-de Haas (SdH) oscillations [1]. We have investigated these phenomena and report magneto transport measurements from a range of InSb/InAlSb QWs with varying carrier density n and mobility μ . It is shown that the inherent large Zeeman splitting combined with inhomogeneous level broadening means that beating in the SdH oscillations in InSb QWs are rarely observed. However, here we show that in InSb/InAlSb QWs, n can be modulated using a gate electric field from $1.15 < n < 3.33 \times 10^{11} \text{cm}^{-2}$ with $13 < \mu < 38 \text{m}^2 \text{V}^{-1} \text{s}^{-1}$ and that under certain conditions weak beating effects can be observed which are attributable to the Rashba effect. Extracted values of the Rashba parameter from beating [2], WAL and k.p modelling [3] is discussed. [1] V.A.Guzenko *et al.*, PRB **76** (16), 165301 (2007) [2] G.Engels *et al.*, PRB **55** (4), R1958 (1997) [3] A.M.Gilbertson *et al.*, PRB **77** (16), 165335 (2008)

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