Abstract Submitted
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g-factor modification by an in-plane electric field in a bulk $In_{0.03}Ga_{0.97}As$ epilayer[1] MARTA LUENGO-KOVAC, SIMON HUANG, RACHEL GOLDMAN, VANESSA SIH, Univ of Michigan - Ann Arbor — The response of an electron spin to a magnetic field, determined by the g-factor, is important for any spin-based device. The modification of the g-factor by a perpendicular electric field has been demonstrated in quantum wells and dots. This can be explained by the electric field shifting the electron wavefunction into the barrier. We found that the g-factor also changes when an in-plane electric field is applied across an $In_{0.03}Ga_{0.97}As$ epilayer. We performed external magnetic field scans of the Kerr rotation of the InGaAs film in order to measure the g-factor independently of the spin-orbit fields. Measurements performed along the [110] and [1-10] crystal axes show the same electric-field dependence of the g-factor, indicating that this change in the g-factor is not related to the spin-orbit fields. Temperature and voltage dependent photoluminescence measurements were also performed, showing that change in the g-factor was not caused by channel heating by the electric field. As there is no quantum confinement along the direction of the electric field, this change in the g-factor is fundamentally different from that seen in quantum wells and dots.

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