Abstract Submitted
for the MAR14 Meeting of
The American Physical Society

Mapping the anisotropic Lande g-factor tensor of 1D GaAs holes in all 3 spatial directions KARINA HUDSON, ASHWIN SRINIVASAN, QINGWEN WANG, LAREINE YEOH, OLEH KLOCHAN, University of New South Wales, IAN FARRER, DAVID RITCHIE, University of Cambridge, ALEX HAMILTON, University of New South Wales — We have studied the Zeeman splitting of 1D holes formed on a (100) GaAs/AlGaAs heterostructure on a single cooldown. The strong spin orbit coupling and 1D confinment give rise to a highly anisotropic spin splitting. By use of the high-symmetry (100) crystal, we eliminate the effects of crystal anisotropy on our measurements. In measuring the spin splitting as a function of angle between the wire and the applied magnetic field, we are able to identify the principle axes of the g-tensor. We show that the principle axes are defined by the potential confining the 1D holes, and are not affected by the crystal axes. We find that $g_{\|}^{\perp} < g_{\|}^{\|} < g_{\perp}$, where $g_{\|}$ refers to the in-plane g-factors parallel and perpendicular to the wire, and $g_{\perp}$ refers to the g-factor perpendicular to the 2D well.

Karina Hudson
University of New South Wales

Date submitted: 15 Nov 2013 Electronic form version 1.4