

Abstract Submitted  
for the MAR13 Meeting of  
The American Physical Society

**Effective Mass and g-factor of 2D Electrons in a HgTe Quantum Well from THz Photoresponse**<sup>1</sup> MEHDI PAKMEHR, A.V. STIER, H.D. ZHANG, University at Buffalo, C. BRUENE, H. BUHMANN, L. MOLENKAMP, University of Wuerzburg, B.D. MCCOMBE, University at Buffalo — There is current interest in HgTe because of its interesting “inverted” band structure and large spin-orbit interaction, and because it is a topological insulator under quantum confinement. Well-widths close to that at which the band structure goes from the “inverted” to the normal structure are of particular interest. We have used photoreponse excited by several lines from an optically pumped THz laser and magnetotransport measurements to determine the cyclotron effective mass and g-factor of 2D electrons in the  $\gamma_6$  conduction band of a high quality HgTe quantum well ( $n_s = 1.55 \times 10^{12} \text{ cm}^{-2}$ ; 6 nm well) at low temperatures. One of the two samples studied was gated, which allowed density to be varied by over 30%. We find  $m^* = 0.039m_e$  and  $g = -18$  at the highest density from fits to the PR with the field normal to the plane of the QW, and separately from CR transmission measurements and tilted field experiments. We will also discuss electron spin resonance measurements near filling factors 7 and 9.

<sup>1</sup>Supported in part by NSF DMR 1008138

B.D. McCombe  
University at Buffalo

Date submitted: 29 Nov 2012

Electronic form version 1.4