Correlation between Hall plateau overshoot and Landau level coincidences in Si/ Si$_{1-x}$Ge heterostructures M. GRAYSON, S. PRABHU-GAUNKAR, EECS Dept., Northwestern University, V. LANG, J. SAILER, D. BOUGEARD, G. ABSTREITER, Walter Schottky Institut, Tech. Univ. Munich — We observe anamolous overshoots in the Hall resistance R_{xy} at even quantized plateaus and compare their positions to the Landau level crossings in the longitudinal resistance R_{xx} in a double valley degenerate Si/ Si$_{1-x}$Ge heterostructure in a tilted magnetic field B. Though such R_{xy} overshoots have been previously observed, their underlying cause is still in dispute. The magneto-transport data is measured on a Hall bar 20 μm wide with a length to width ratio of 20, etched on a 2DEG with density $n = 3.4 \times 10^{11}$ cm^{-2} and mobility $\mu = 70{,}250$ cm^2/Vs. The sample shows overshoot at 0° tilt angle. Overshoots also appear at the even filling factors $\nu = 6, 10, 14$ *etc.* at an angle of 76.3° and at $\nu = 8, 12, 16$ *etc.* at 79.41° while disappearing at the previous factors. The angles at which the Landau level's coincide are identified from the longitudinal resistance R_{xx} minima and differ from the angles of maximum overshoot. These results will be discussed in the light of the recent theory of remnant incompressible strips by Siddiki et al.[1]

[1] A. Siddiki, J. Horas, J. Moser, W. Wegscheider, and S. Ludwig. Euro. Phys. Lett., 88(1), OCT 2009.

Matthew Grayson
Northwestern University