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Spin resonance and spin-orbit coupling effects in quantum Hall edge channels[1] A.V. STIER, C.J. MEINING, V.R. WHITESIDE, B.D. MCCOMBE, University at Buffalo, E.I. RASHBA, Harvard University, P. GRABS, L.W. MOLENKAMP, Universitaet Wuerzburg — We report studies of far-infrared (FIR) photo-response (E_{FIR}=3.15meV) of a 2D electron gas in an asymmetric 15nm InAs quantum well in a field/frequency regime where electron spin resonance is expected. Photo-induced changes in the longitudinal resistance were measured in a Hall-bar geometry in a tilted magnetic field (B) whose angle θ was varied. For $\theta \approx 40^\circ$ and Landau Level (LL) filling factor $\nu \approx 7$, we observe several sharp minima with a dominant central feature. This feature vanishes for $\theta < 38.4^\circ$ and splits into two sharper lines at larger angles. The center of gravity of this pair tracks approximately the center of the $\nu = 7$ Quantum Hall (QH) plateau. The appearance of the central feature coincides with the condition of complete filling of the ν=7 LL at an applied B where the Zeeman spin splitting equals the energy of the FIR laser line. We attribute the sharp multiple line structure to EDSR transitions in pairs of QH edge channels whose resonance conditions are modified by Rashba effective fields. A detailed model that describes qualitatively the experimental findings will be discussed.

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