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Quantum Hall effect and insulating state near the charge neutrality point in an InAs/GaSb quantum well[1] ATINDRA NATH PAL, FABRIZIO NICHELE, PATRICK PIETSCH, THOMAS IHN, KLAUS ENSSLIN, CHRISTOPHE CHARPENTIER, WERNER WEGSCHEIDER, Solid State Physics Laboratory, ETH Zurich, 8093 Zurich, Switzerland — We present transport measurements in a gated InAs/GaSb double quantum well (QW) sandwiched between two AlSb barriers. In this system a QW for electrons in InAs and a QW for holes in GaSb coexist next to each other and a hybridization gap is expected to occur. We can tune the transport from electrons to the holes by applying a top gate voltage. In presence of a perpendicular magnetic field, we observe well defined quantum Hall plateaus in both sides. Interestingly, at the charge neutrality point a strong increase in the longitudinal resistivity is observed with increasing perpendicular magnetic field, accompanied by the onset of a non-local resistance of similar magnitude. The co-existence of these two effects is described by a model of counter-propagating and dissipative quantum Hall edge channels, shorted by a residual bulk conductivity.

Reference: Fabrizio Nichele *et al.*, arXiv:1308.3128 (2013). Christophe Charpentier *et al.*, *Appl. Phys. Lett.* 103, 112102 (2013).

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