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Mapping the topological-to-normal insulator phase transition in InAs/GaSb bilayers by heterostructure variation[1] BORZOYEH SHOJAEI, Materials Department, University of California at Santa Barbara, ANTHONY P. MCFADDEN, Department of Electrical and Computer Engineering, University of California at Santa Barbara, JOON SUE LEE, California NanoSystems Institute, MIHIR PENDHARKAR, Department of Electrical and Computer Engineering, University of California at Santa Barbara, CHRIS J. PALMSTRM, Materials Department, Department of Electrical and Computer Engineering, University of California at Santa Barbara — When 2D electron and hole subbands in InAs/GaSb bilayers are tuned to the inverted regime the system is predicted to exhibit an insulating bulk and counter propagating helical 1D edge states. This work presents a dual-gate mapping of the topological-to-normal insulator phase transition for several InAs/GaSb bilayers wherein the InAs and GaSb layer thicknesses are varied. In-plane and out-of-plane magnetotransport experiments reveal the effect of heterostructure geometry on the magnitudes of the longitudinal and Hall magnetoresistances and on the shape and temperature dependence of the gate-tuned resistance map in the vicinity of the phase transition.

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Borzoyeh Shojaei
Materials Department, University of California at Santa Barbara

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