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Magneto-transport Properties Using Top-Gated Hall Bars of Epitaxial Heterostructures on Single-Crystal SiGe Nanomembranes[1] R.B. JACOBSON, YIZE LI, RYAN FOOTE, XIAORUI CUI, DONALD SAVAGE, PORNSATIT SOOKCHOO, MARK ERIKSSON, MAX LAGALLY, University of Wisconsin-Madison — A high-quality 2-dimensional electron gas (2DEG) is crucial for quantum electronics and spintronics. Grown heterostructures on SiGe nanomembranes (NMs) show promise to create these 2DEG structures because they have reduced strain inhomogeneities and mosaic tilt. We investigate charge transport properties of these SiGe NMs/heterostructures over a range of temperatures and compare them with results from heterostructures grown on compositionally graded SiGe substrates. Measurements are done by creating Hall bars with top gates on the samples. From the magneto-transport data, low-carrier-density mobility values are calculated. Initial results on the grown heterostructures give a typical curve for mobility versus carrier density, but extraction of the zero-carrier-density mobility is dependent on the curve-fitting technique.

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