Abstract Submitted
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Hall field-induced resistance oscillations in MgZnO/ZnO heterostructures[1] M. ZUDOV, Q. SHI, University of Minnesota, J. FALSON, Max-Planck-Institute for Solid State Research, Y. KOZUKA, The University of Tokyo, A. TSUKAZAKI, Tohoku University, M. KAWASAKI, The University of Tokyo, RIKEN Center for Emergent Matter Science , K. VON KLITZING, J. SMET, Max-Planck-Institute for Solid State Research — We report on a nonlinear magnetotransport study of a two-dimensional electron gas hosted in a MgZnO/ZnO heterostructure, a recently emerged high-quality material system. We find that upon application of a sufficiently high direct current, the differential resistivity exhibits pronounced Hall field-induced resistance oscillations (HIRO) which are well known from low magnetic field (B $\sim$ 0.1 T) experiments on GaAs/AlGaAs and, more recently, Ge/SiGe quantum wells. Owing to much higher effective electron mass in our system ($m^\star \approx 0.3m_0$, m_0 is a free electron mass), we were able to observe HIRO extending to fields above 5 T. Exclusive sensitivity of HIRO to a short-range component of the disorder potential allows us to unambiguously conclude that the mobility of our sample is limited by large-angle scattering off impurities within or near the 2D channel.

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