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Anomalous Hall Effect in a 2DEG Containing Magnetic Impurities JOHN CUMINGS, Stanford University, DAVID GOLDHABER-GORDON, Stanford University, KEH-CHIANG KU, Pennsylvania State University, GANG XIANG, NITIN SAMARTH, Pennsylvania State University — The has been great interest recently in the role of electron spin in transport properties, specifically in the phenomena of the spin-Hall and anomalous-Hall effects. We present low- temperature transport measurements on a modulation-doped quantum well containing magnetic (Mn) impurities. The effect of the impurities is to cause a strong (free-spin) paramagnetic Zeeman- splitting of the carriers due to s-d exchange interactions. In recent measurements, we observe a Hall voltage that scales with the magnetic moment of the material, a signature of the anomalous-Hall effect. This is surprising, given that the material is not ferromagnetic and does not have a magnetically- ordered ground state. This has important implications for spin- transport in a large class of two-dimensional electron systems.

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