Abstract Submitted
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Energy relaxation in a low-density nonequilibrium 2D hole gas at the quantum hall plateau-plateau transition[1] DIMITRII KRUGLOV, ELINA KLYSHEVA, University of Cincinnati, Ohio, ANDREI KOGAN, kruglodi@mail.uc.edu, CHIEH-WEN LIU, XUAN GAO, Case Western Reserve U., Cleveland, OH 44106, LOREN PFEIFFER, KENNETH WEST, Princeton University — We have measured the derivative S = Rxy/dB of the transverse resistance Rxy vs magnetic field B at the =3 -¿ = 2 (B=0.45 T) quantum Hall plateau-plateau transition (PPT) , as function of the sample temperature T and dissipated Joules power P in a low-density, p-doped GaAs/AlGaAs quantum well with a high interaction parameter rs 23 (nh= 2.9 x 1010 /cm-2 , hole mobility = 2.4 x 105 cm2/Vs). We present P-T curves constructed by matching P and T values at a given S, and compare these to a set of similar curves obtained for the sample resistance R at B=0. At low temperatures, the P-T data in the magnetic field and at B=0 diverge, suggesting that the thermal coupling between the holes and the lattice increases in the magnetic field and makes the holes effectively cooler at a given P. We also find that the thermal coupling in the magnetic field shows a weaker temperature dependence than at B=0. We compare these findings to an earlier work on a system with a lower rs=2.17 [1] and compere to available theoretical predictions. [1] Edmond Chow, H. P. Wei, S. M. Girvin, and M. Shayegan, Physical review letters, 1996. Vol. 77(6), pp 1143-1146.

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