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Mass Renormalization in 2D Measured by Tunneling Spectroscopy OLIVER DIAL, RAYMOND ASHOORI, MIT, LOREN PFEIFFER, KEN WEST, Alcatel-Lucent Bell Laboratories — We use a novel technique, time domain capacitance spectroscopy, to measure the single particle density of states of a 2D electron gas. This technique allows quantitative measurements of the energies of features in the single particle spectrum. Applying a magnetic, we observe a series of Landau levels. However, the observed Landau levels are not evenly spaced – electron-electron interactions modify the cyclotron energy. This is in stark contrast to optical techniques, which always observe the non-interacting cyclotron energy due to Kohn’s theorem. At low magnetic fields, we can interpret changes in the cyclotron energy as changes in the electron mass, and use the spectrum to map the electron mass not just as a function of density, but also as a function of energy away from the Fermi surface.

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