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Effective mass from microwave photoresistance in high-mobility 2D electron systems[1] MICHAEL ZUDOV, ANTHONY HATKE, School of Physics and Astronomy, University of Minnesota, Minneapolis, Minnesota 55455, USA, JOHN WATSON, MICHAEL MANFRA, Department of Physics, Purdue University, West Lafayette, Indiana 47907, USA, LOREN PFEIFFER, KENNETH WEST, Princeton University, Department of Electrical Engineering, Princeton, New Jersey 08544, USA — We have performed microwave photoresistance measurements in high mobility GaAs/AlGaAs quantum wells and investigated the value of the effective mass. Surprisingly, the effective mass, obtained from the period of microwave-induced resistance oscillations, is found to be considerably lower than the band mass in GaAs. This finding provides evidence for electron-electron interactions which can be probed by microwave photoresistance in very high Landau levels. In contrast, the measured magneto-plasmon dispersion revealed an effective mass which is close to the band mass, in accord with previous studies.

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