Microwave photoexcited magnetoresistance in the high mobility GaAs/AlGaAs system RAMESH MANI, Harvard University — The microwave-photoexcited high mobility GaAs/AlGaAs two dimensional electron system exhibits an oscillatory magnetoresistance with vanishing resistance in the vicinity of magnetic fields $B = [4/(4j+1)]B_f$ where $B_f = 2\pi f m^*/e$ and $f$ is the radiation frequency. Here, we report experimental results examining microwave induced phenomena in regimes where (a) the Landau level spacing, which is of the order of or smaller than the photon energy, exceeds both a broadening parameter defined from the transport time and $k_B T$, and (b) where the Landau level spacing significantly exceeds the photon energy.