Two-Electron Linear Intersubband Absorption in a Biased Quantum Well

JIAN DAI, MIKHAIL RAIKH, University of Utah, TIGRAN SHAHBAZYAN, Jackson State University — Linear light absorption of 2D electrons confined within a biased quantum well is studied theoretically. We demonstrate that, for light polarization perpendicular to the 2D plane, in addition to conventional absorption peak at frequency $\hbar \omega \approx \Delta$, where $\Delta$ is the intersubband energy distance, there exists a peak around a double frequency $\hbar \omega \approx 2\Delta$. This additional peak is entirely due to electron-electron interactions, and corresponds to excitation of two electrons by one photon. The magnitude of two-electron absorption is proportional to $U^2$, where $U$ is the applied bias.