Abstract Submitted
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Transport of Indirect Excitons in High Magnetic Fields[1] C. J. DOROW, Y. Y. KUZNETSOVA, E. V. CALMAN, L. V. BUTOV, University of California San Diego, J. WILKES, Cardiff University, K. L. CAMPMAN, A. C. GOSSARD, University of California Santa Barbara — Spatially- and spectrally-resolved photoluminescence measurements of indirect excitons in high magnetic fields are presented [1]. The high magnetic field regime for excitons is realized when the cyclotron splitting compares to the exciton binding energy. Due to small mass and binding energy, the high magnetic field regime for excitons is achievable in lab, requiring a few Tesla. Long indirect exciton lifetimes allow large exciton transport distances before recombination, giving an opportunity to study transport and relaxation kinetics of indirect magnetoexcitons via optical imaging. Indirect excitons in several Landau level states are realized. $0_\mathrm{e} - 0_\mathrm{h}$ indirect magnetoexcitons (formed from electrons and holes at zeroth Landau levels) travel over large distances and form an emission ring around the excitation spot. In contrast, the $1_\mathrm{e} - 1_\mathrm{h}$ and $2_\mathrm{e} - 2_\mathrm{h}$ states do not exhibit long transport distances, and the spatial profiles of the emission closely follow the laser excitation. The $0_\mathrm{e} - 0_\mathrm{h}$ indirect magnetoexciton transport distance reduces with increasing magnetic field. Accompanying theoretical work explains these effects in terms of magnetoexciton energy relaxation and effective mass enhancement. [1] arXiv:1610.03116.

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