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Cooperative Emission from Semiconductor Quantum Wells in High Magnetic Fields[1] D. H. REITZE, Y. D. JHO, X. WANG, Physics Dept., University of Florida, J. KONO, Dept. of Electrical and Computer Engineering, Rice University , A. A. BELYANIN, V. V. KOCHAROVSKY, Physics Department, Texas A&M University, G. SOLOMON, Solid State Laboratories, Stanford University, X. WEI, NHMFL — Stochastically oriented, spectrally-peaked emissions is generated in $In_{0.2}Ga_{0.8}As/GaAs$ multiple quantum wells (QW). Using intense 150 fs, 775 nm pulses for excitation, we investigate the spatial and temporal characteristics of the emission in dense magneto-plasmas in high magnetic fields (30 T) and at carrier densities approaching 10^{13} cm^{-2}. Above a threshold intensity and magnetic field, the emission from Landau levels exhibit anomalous narrow features appearing asymmetrically on the high-energy side of the peaks. An examination of the spot size dependence of emission strength relative to the coherence length, temperature dependence of threshold magnetic field, and differential transmission spectra suggest that the inter-LL emission arises from the spontaneous polarization of the dense magneto-plasma.

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