

Photocurrent-induced Transport of Exciton Energy in a  
Single Heterojunction Quantum Well

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Excitons which coexist with a degenerate two-dimensional electron gas (2DEG) in the same quantum well subband have been observed in the photoluminescence (PL) from the recombination of electrons with localized photoexcited holes. Under pulsed photoexcitation at a critical applied voltage, the screening/polarization response of the 2DEG/exciton system to the appearance of a remote photocurrent filament in the 2DEG induces an increase in the integrated PL intensity, the formation of long-lifetime excitons in the excitation region and long-lifetime red-shifted PL from the excitation region and the region around the filament. Our data suggests the occurrence of a fast long range transport of exciton energy.