Abstract Submitted
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Exchange-driven re-entrant layer-occupancy transitions in biased bilayer systems[1] J.R. RODRIGUEZ, C.B. HANNA, Boise State University — Hamilton *et al.* showed experimentally that an externally biased double-quantum-well system in zero magnetic field could exhibit an exchange-driven bilayer-to-monolayer ("2-1") transition as the total carrier density was increased. This transition is due to the combined effects of the negative compressibility of the low-density carriers and the layer imbalance produced by external gate biases. We give an approximate criterion for observing a re-entrant "2-1-2" transition that repopulates the emptied layer as the total carrier density is further increased. The gate voltages required for repopulation are shown to be impractically high for p-type GaAs bilayer devices with hole carriers. We show, however, that it may be possible to observe a "2-1-2" transition in low-density n-type electron bilayer systems with very small layer separations.

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