

Abstract Submitted
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Effect of Disorder on Excitonic Coherence in Double Layer Systems¹ PAUL CAMPITELLI, JOHN SHUMWAY, Dept. of Physics, Arizona State University — We use fermionic path integral quantum Monte Carlo to study the effects of disorder on properties of dipolar exciton condensates in double layer systems. Such exotic states of matter have been predicted in semiconductor heterojunctions, double layer graphene, and thin slabs of topological insulators. In our model, we find that the condensation transition is in the Bose-Einstein condensation (BEC) limit, with pre-formed fermionic pairs (excitons) condensing below a critical temperature. Evidence for the transition is seen in the superfluid fraction, which we estimate from paths winding around the simulation cell. We investigate the effect of charge impurities near the layers. We compare and contrast the effect of the charge impurity on a single exciton to the effect on the excitonic condensate.

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