

Abstract Submitted  
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**DMRG Study of a  $\nu = 1/3 + 1/3$  Bilayer Fractional Hall System**

SCOTT GERAEDTS, California Institute of Technology, MICHAEL ZALETEL, Microsoft Station Q, ZLATKO PAPIC, Perimeter Institute, ROGER MONG, University of Pittsburgh — DMRG Study of a  $\nu = 1/3 + 1/3$  Bilayer Fractional Hall System Bilayer quantum Hall systems provide new experimental parameters that generate a rich phase diagram proposed to contain to new non-Abelian phases. We use the density matrix renormalization group (DMRG) and exact diagonalization to study a bilayer quantum Hall system with filling fraction  $1/3$  per layer. Using this method, we can study the phase diagram in terms of parameters such as interlayer separation, interlayer tunnelling, layer width, and density imbalance between the layers. We identify the possible phases based on their entanglement properties and determine the order of phase transitions. Prospects for stabilizing new non-Abelian phases with small perturbations to the Coulomb interaction will be discussed.

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