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Few-body treatment of the quantum Hall system[1] RACHEL WOOTEN, KEVIN DAILY, CHRIS H. GREENE, Purdue University — When confined to a finite, two-dimensional area and exposed to a strong magnetic field, fermions exhibit complicated, highly-correlated quantum behavior known as the quantum Hall effect [1]. At certain electron densities and magnetic fields, the system exhibits strong quantization due entirely to Coulomb interactions. Typical theoretical studies in the field consist of many-body numerical configuration interaction calculations performed in an energy-restricted single-particle Hilbert subspace. So far, quantum Hall behavior has been observed experimentally only in condensed matter systems, but there is significant interest in reproducing and studying the effect in highly-controlled cold atom systems. In light of such potential experimental developments, we approach the theoretical study of the quantum Hall system from a few-body perspective using the hyperspherical adiabatic technique [2] developed originally for atomic systems.

[1] D. C. Tsui, H. L. Stormer, and A. C. Gossard, Phys. Rev. Lett. **48**, 1559 (1982).
[2] J. Macek, J. Phys. B:. At. Mol. Phys., **1** 831 (1968).

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