Abstract Submitted
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Link between the hierarchy of fractional quantum Hall states and Haldane's conjecture for quantum spin chains[1] MASAAKI NAKAMURA, Tokyo Institute of Technology, EMIL BERGHOLTZ, Max-Planck-Institut fuer Physik komplexer Systeme, JUHA SUORSA, University of Oslo — We study a strong coupling expansion of the $\nu = 1/3$ fractional quantum Hall state away from the Tao-Thouless limit and show that the leading quantum fluctuations lead to an effective spin-1 Hamiltonian that lacks parity symmetry. By analyzing the energetics and discrete symmetries of low-lying excitations, we demonstrate that the $\nu = 1/3$ fractional quantum Hall state is adiabatically connected to both Haldane and large-D phases. This result indicates a close relation between the Haldane conjecture for spin chains and the fractional quantum Hall effect.

[1]Global Center of Excellence Program "Nanoscience and Quantum Physics" of the Tokyo Institute of Technology by MEXT

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