Abstract Submitted
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A DMRG Study of MoS_2 JORDAN VENDERLEY, Cornell University — In a recent work, Hsu, Vaezi, and Kim predicted spatially modulated, topological superconductivity in a class of materials known as transition metal dichalcogenides (TMDs) by studying RG flow.[1] Since electrons can readily develop topological superconductivity at low temperatures when spin-degeneracy is lifted, their insight was to exploit the spin-splitting of the TMD valance band in k-space in order to induce p-wave pairing. With experimental efforts currently underway to realize this phenomenon, particularly in monolayer, hole-doped MoS_2, it is important to have a non-perturbative check on this result. To this end, we employ a density matrix renormalization group (DMRG) approach to study MoS_2. We probe the superconducting susceptibility of the system and explore the properties of its order parameter in order to confirm the predicted FF (Fulde-Ferrell) p_x+ip_y phase. A quantitative understanding of the Hamiltonian parameters will provide guidance in experimental efforts to realize this topological superconductor and help ensure that the proposed material will indeed exhibit the expected order. 1.) Y.-T. Hsu, A. Vaezi, E.-A. Kim. Topological modulated superconductivity in monolayer transition metal dichalcogenides, in preparation (2015).

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