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Chern-Simons theory for frustrated quantum magnets KRISHNA KUMAR, EDUARDO FRADKIN, University of Illinois at Urbana-Champaign — We study the problem of frustrated quantum magnets by mapping models with Heisenberg spins, which are hard-core bosons, onto a problem of fermions coupled to a Chern-Simons gauge field [1]. Similar methods have been used successfully in the case of unfrustrated systems like the square lattice [2]. However, in the case of frustrated systems there always exists some arbitrariness in defining the problem. At the mean-field level these issues can be over looked but the effects of fluctuations, which are generally strong in these systems, are expected to alter the mean-field physics [3-4]. We discuss the difficulties involved in setting up this problem on a triangular or kagome lattice and some approaches to tackle these issues. We study the effects of fluctuations in these systems and the possibility of spin-liquid type phases.

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