Poster-1-12

Schwinger boson study of the J1-J2-J3 kagome Heisenberg antiferromagnet with Dzyaloshinskii-Moriya interactions

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Schwinger boson mean-field theory is a powerful approach to study frustrated magnetic systems, which allows to distinguish long-range magnetic orders from quantum spin liquid phases, where quantum fluctuations remain strong up to zero temperature. In this paper, we use this framework to study the Heisenberg model on the kagome lattice with up to third-nearest-neighbor interaction and Dzyaloshinskii-Moriya (DM) antisymmetric exchange. This model has been argued to be relevant for the description of transition metal dichalcogenide bilayers in certain parameter regimes [1], where spin liquids could be realized. By means of the projective symmetry group classification of possible ansätze, we study the effect of the DM interaction at first-nearest neighbor and then compute the J2-J3 phase diagram at different DM angles. We find a phase displaying chiral spin liquid characteristics up to spin S=0.5, indicating an exceptional stability of the state.

[1] J. Motruk, D. Rossi, D. A. Abanin, and L. Rademaker, Kagome chiral spin liquid in transition metal dichalcogenide moiré bilayers, Phys. Rev. Res. 5, L022049 (2023).