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Phase Diagram of a Quantum Ising Model with Long-Range Interactions DAVID SMITH, SPENCER LEEPER, CHRISTOPHER VARNEY, The University of West Florida — Advancements in utilizing ultra-cold gases as quantum spin simulators are allowing for the exploration of frustrated networks in two-dimensional spin-1/2 systems. Frustrated exchange interactions can result in exotic states and excitations, such as quantum spin liquids and spin glasses. Here we investigate the effect of long-range interactions in the quantum XXZ model on a square lattice. The complete phase diagram of the model is obtained utilizing exact diagonalization and the stability of all phases is discussed.

David Smith
Univ of West Florida

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