Project Title:

Condensed matter physics (theory)

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We have been working on frustrated spin systems. In general, we are trying to model magnetic insulators and explain experimental measurement of magnetization curves and other physical quantities. More specifically, we are studying magnon condensation induced by high magnetic field in several frustrated models, by employing the Bethe-Salpeter equation to determine the interaction among magnons. The problem can be reduced in our approach to evaluating certain integrals over the Brillouin zone and then solve a linear algebraic system given in terms of them. So far we have dealt with two-magnon scattering, which allowed us to perform calculation with just a desktop machine. However we plan to take on the three-magnon scattering problem, which needs in principle considerably more computational power. For now however, we have managed to do some analytic preparatory work.