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Abstract:

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Dynamical spin structure factor, $S(q, \omega)$, is an experimentally measurable quantity, measured via inelastic Neutron scattering experiments. Inelastic Neutron scattering has been a very useful technique to study excitation spectrums in magnetic systems. In this project, we numerically calculate $S(q, \omega)$ for one-dimensional magnetic systems. We start with a one-dimensional ferromagnet and antiferromagnet case and then go on to explore spin-spirals. We use Monte Carlo annealing to obtain a stable spin configuration, and Landau-Lifshitz spin dynamics to evolve the state in time. We obtain $S(q, \omega)$ by taking the space-time Fourier transform of dynamical spin-spin correlation.

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