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Lattice Symmetry Breaking of Spin Wave Propagation in Two-Dimensional Magnonic Crystals[1] GLADE SIETSEMA, MICHAEL E. FLATTÉ, Univ of Iowa — We solve the Landau-Lifshitz-Gilbert equation for spin waves in a two-dimensional magnonic crystal using the plane wave expansion method[1]. In doing this we have found that the inclusion of the dipolar field in the LLG equation results in the dispersion relations and linewidths having a lower symmetry than the crystal latice. The magnitude of this symmetry breaking is determined by the strength of the dipolar field relative to the exchange field. Adjusting the crystal parameters can change the relative strength of these fields, thereby allowing this effect to be enhanced or reduced. We have also calculated the Green's functions for this system, which show highly directional propagation of the spin waves depending on the excitation frequency.

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