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Polarized Inelastic Neutron Scattering study of $TbMnO_3$[1]
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— Low energy collective excitations in $TbMnO_3$ were examined using polarized inelastic neutron scattering. By probing spin flip and non-spin-flip excitations with a guide field along wave vector transfer, Q, we separated the magnetic and vibrational components of excitations at high symmetry points in the Brillouin zone. We report signatures of coupled magnon-phonon excitations in the ferroelectric-spiral state, which disappear in the paramagnetic phase. These results will be discussed in terms of current models of electromagnons in the $R\mathrm{MnO}_3$ multiferroic family.

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