

# Dynamics near the multiferroic phase transition

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In magnetoelectric multiferroics the onset of ferroelectricity is coupled to the onset of inversion-symmetry breaking magnetic structure.

The dynamics of such complex order can be probed via the dielectric response of the system. A prominent feature is the stimulation of (electro-)magnons via electric field in the THz-range.

But as well at lower frequencies diverse dispersive features can be found, especially in the region around the multiferroic phase transition. As an example we studied the dielectric response of  $\text{MnWO}_4$ , which possesses a ferroelectric phase driven by cycloidal magnetism, using linear and non-linear spectroscopy in a frequency range from mHz to several GHz.

The results denote the critical slowing down of the dynamics above the onset of multiferroic order, while the dielectric response of the ordered phase is dominated by the dynamics of domains and domain walls respectively.