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Title:Electrically active magnetic excitations in antiferromagnets
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Abstract:The magnetic resonance operation by electric field is highly nontrivial but the most demanding function in the future spin-electronics. Recently observed in a variety of multiferroics materials named the collective electrically active magnetic excitations, frequently referred to as "electromagnons", reveal a possible way to implement such a function. Experimental advances in terahertz spectroscopy of electromagnons in multiferroics as well as related theoretical models are reviewed. The earlier theoretical works, where the existence of electric-dipole active magnetic excitations in antiferro- and ferrimagnets with collinear spin structure has been predicted, are also discussed. Multi-sublattice magnets with electrically active magnetic excitations at room temperature give a direct possibility to transform one type of excitation into another in a terahertz time-domain. This is of crucial importance for the magnon-based spintronics as only the short-wavelength exchange magnons allow the signal processing on the nanoscale distance.
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