Abstract Submitted
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Magnons and electromagnons in multiferroic materials[1] MAXIM MOSTOVOY, Materials Science Center, University of Groningen — The interest in studying excitations in frustrated magnets lies in their unusual nature and strong effect on frustrated ordering. The coupled spin-lattice dynamics in frustrated magnets, in which magnetic ordering breaks inversion symmetry and induces electric polarization, was recently studied in optical absorption and neutron scattering experiments. I will present a theory of magnetic excitations coupled to polar phonon modes (electromagnons) in multiferroic materials showing incommensurate magnetic orders, e.g. $RMnO_3$, $Ni_3V_2O_8$, and $MnWO_4$, and discuss the evolution of the excitation spectrum at the transition from the paraelectric sinusoidal to the ferroelectric spiral state. The incommensurate orders give rise to a multi-band structure of magnetic excitations, while the magnetoelectric coupling makes possible to excite magnons by oscillating electric field. Even for weak coupling the probability of electro-excitation of magnons is relatively large. Furthermore, the polarization dependence of the optical absorption makes possible to discriminate between the electromagnon and antiferromagnetic resonance peaks. I will also discuss electromagnons in a different class of multiferroics, such as the RMn_2O_5 compounds.

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