Abstracts

Application of Submillimeter Spectroscopy to Magnetic Excitations

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Magnetic excitations are the collective excitations of the magnetic moments in ferro- and antiferromagnets. The frequencies are mostly in the far-infrared spectral range. Their study is of current interest with respect to the properties of phase transitions, since in ordinary 3-dimensional crystals the dominating exchange interactions can be 3-dimensional (MnF/sub 2/, NiO) or may be restricted to 2 dimensions (K/sub 2/MnF/sub 4/CoCl/sub 2/ or even to 1 dimension (CsNiF/sub 3/, CoCI/sub 2/ 2H/sub 2/O). In this paper, an introduction and a review is given of the results on q = 0 magnon modes (ferro- or antiferromagnetic resonance) which can be studied rather directly by submillimeter-wave spectroscopy. Some results about 2 magnon bands are also mentioned. Experimentally, grating monochromators, Fourier-transform interferometers, FIR laser, and microwave techniques have been employed. In the past, not only pure materials have been studied but also doped crystals where localized magnon modes can occur (MnF/sub 2/:Co/sup 2+/, CoF/sub 2/:MnF/sub 2/, NiO:Co/sup 2+/).

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