Are there optical magnons?

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Optical magnons can occur in magnets with two chemically different magnetic species only. However, exchange interactions between in-equivalent magnetic moments are weak because free exchange of electrons appears not generally possible. To the best of our knowledge optical magnons have never been identified experimentally. Confusion is provided by the fact that two magnon branches commonly occur in antiferromagnets with ferromagnetically ordered crystallographic planes and opposite spin orientations from plane to plane. This applies to $MnO, EuTe, CoCl_2, Fe_2O_3, K_2MnF_4$. Associated with the ferromagnetic planes is a particular low-energy magnon branch. The high-energy magnon branch is the antiferromagnetic magnon branch and not an optical magnon. Because of weak exchange interactions between chemically different magnetic moments, the two magnon branches in Fe_3O_4 can be attributed to the FeO and to the Fe_2O_3 subsystem, respectively. The order parameters of the FeO subsystem and of the Fe_2O_3 subsystem have different temperature dependencies. In $Rb_2Mn_{0.5}Ni_{0.5}F_4$ the two magnon branches can be attributed to the Rb_2MnF_4 and to the Rb_2NiF_4 subsystem, respectively. Search for low-energy optical magnons remains a big challenge for inelastic neutron scattering.