Abstract Submitted
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Exchange Constants from Combined Light and Neutron Scattering Experiments: Application to Magnetoelectric $LiMnPO_4$[1] CESAR J. CALDERON FILHO, PAULO F. GOMES, ALI F. GARCÍA-FLORES, GASTON E. BARBERIS, UNICAMP - Univ. Estadual de Campinas, DAVID VAKNIN, Ames Laboratory and Iowa State University, EDUARDO GRANADO, UNICAMP - Univ. Estadual de Campinas — Two-magnon Raman scattering is observed in magnetoelectric $LiMnPO_4$, carrying quantitative information on the magnetic interactions between local Mn^{2+} moments. A simulated annealing fitting procedure using these Raman data combined with magnon dispersion curves from neutron diffraction is demonstrated to greatly improve the accuracy and reliability of the determined exchange constants up to at least fifth-nearest neighbors. First-nearest neighbor interactions are shown to be largely dominant in $LiMnPO_4$, ruling out magnetic frustration as a relevant ingredient for this material. This methodology may be instrumental to investigate other magnetoelectric and multiferroic materials as well as superconductors at the border of magnetism, where knowledge of exchange constants without ambiguity is important to pin down the relevant physics.

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