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Title:
Anisotropic spin couplings in NaNiO_2

Abstract:
At high temperatures LiNiO_2 and NaNiO_2 are isostructural Mott insulators. Each has a two-fold orbital degree of freedom and a two-fold spin degree of freedom (Kramer's degeneracy). At low temperatures we would expect both materials to undergo a structural transition to remove the orbital degree of freedom, as well as a magnetic ordering transition to remove the Kramers degeneracy. NaNiO_2 behaves as predicted, however no measurements to date have found signs of either a structural transition or magnetic ordering in LiNiO_2 . Although people have failed for decades to understand LiNiO_2 it should be possible to determine the magnetic structure of NaNiO_2 which, in turn, may lead to insight regarding the magnetic behaviour of LiNiO_2 .

With this goal in mind, I will present a calculation which determines the anisotropic spin couplings in NaNiO_2 assuming that the anisotropy comes from a spin orbit interaction and compare the results to inelastic neutron scattering data.