Low Temperature Structural Investigations of the J_1-J_2 Model System $VOMoO_4$

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Frustrated magnets based on transition metal oxides have become subjects of many theoretical and experimental studies in the last ten years [1, 2]. One of the most widely studied model systems is the so-called J_1-J_2 model, i.e. the spin-1/2 Heisenberg antiferromagnet on a square lattice with competing nearest (J_1) and next-nearest (J_2) neighbor antiferromagnetic interactions. Thanks to their structure, Li_2VOSiO_4 and Li_2VOGeO_4 [3] are shown to be the first prototypes of this frustrated two-dimensional system [4, 5] and have enabled to check experimentally several theoretical predictions in the region of the phase diagram in which $J_1 \approx J_2$. This work has been extended these last two years to the closely related system $VOMoO_4$ [6]. $VOMoO_4$ crystallizes in the tetragonal space group $P4/n$ with 2 formula units per cell, the spin-1/2 V^{4+} ions forming a network of VO_5 square pyramids, sharing corners with MoO_4 tetrahedra. The main difference with respect to Li_2VOSiO_4 and Li_2VOGeO_4 (space group $P4/nmm$) is the absence of Li to separate the layers of XVO_5 (X = Si, Ge or Mo).

This contribution will give an overview of recent results obtained by low temperature x-ray and neutron diffraction on the $VOMoO_4$ phase. An anomalous evolution of the lattice parameters [7] which could be related to its magnetic properties was clearly revealed.

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