Poster Presentation

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Investigation of the Orbital and magnetic orderings in VF3

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We report on a magnetic and structural investigation of layered antiferromagnetic system vanadium (III) fluoride. VF3 crystallizes in a distorted ReO3 structure (R-3c) with rotated undistorted VF6 octahedra. The V3+ cations are arranged in a triangular lattice with the possibility of exhibiting magnetic frustration. Polycrystalline samples of VF3 were investigated using heat capacity, dielectric, magnetic susceptibility, synchrotron and neutron powder diffraction methods. Combining our results, we report the first evidence for a first order phase transition resulting from the ordering of the t2g orbitals below 105-110 K. This transition reduces the symmetry to C2/c. We further confirm that VF3 undergoes a long-range antiferromagnetic order at ∼19 K in accordance with literature [1]. The antiferromagnetic order results in a magnetic structure with the magnetic moments alternating between a parallel and b parallel alignments in the ab plane.

[1] *A.C. Gossard, H.J. Guggenheim, F.S.L. Hsu, and R.C. Sherwood, AIP Conf. Proc., No. 5, 302 (1971).*

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