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Elastic properties of the vanadate spinel MnV_2O_4 V. KEPPENS, Y. LUAN, Dept. Materials Science and Engineering, The University of Tennessee, V.O. GARLEA, Neutron Scattering Sciences Division, Oak Ridge National Laboratory, R. JIN, D. MANDRUS, Materials Science and Technology Division, Oak Ridge National Laboratory — Spinel vanadates AV_2O_4 are known to undergo a cubic-to-tetragonal structural phase transition (SPT) at temperature T_S and order magnetically at lower temperature T_N. ZnV_2O_4 is characteristic of the entire series and has received extensive theoretical attention. When Mn occupies the A site there is an additional superexchange interaction between Mn and V. This superexchange interaction leads to ferrimagnetic order at about 56 K, involving a ferromagnetic configuration of the V spins. The current work focuses on the elastic properties of MnV_2O_4. Resonant Ultrasound Spectroscopy (RUS) has been used to measure the elastic response of the sample, as a function of temperature (5-300K) and magnetic field (0-7 Tesla). The temperature dependence of the frequencies is found to be quite unusual, displaying a softening over a large temperature range. Measurements in magnetic field reveal an additional feature near 50 K, which could represent a striking manifestation of direct spin-orbital coupling.

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