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Evidence for strong orbital fluctuations below the Jahn-Teller transition in $\text{Sr}_3\text{Cr}_2\text{O}_8$ J. DEISENHOFER, ZHE WANG, M. SCHMIDT, A. GÜNTHER, S. SCHAILE, N. PASCHER, F. MAYR, Y. GONCHAROV, H.-A. KRUG VON NIDDA, A. LOIDL, Experimental Physics V, Center for Electronic Correlations and Magnetism, Institute of Physics, University of Augsburg, D-86135 Augsburg, Germany, D.L. QUINTERO-CASTRO, A.T.M.N. ISLAM, B. LAKE, Helmholtz-Zentrum Berlin für Materialien und Energie, D-14109 Berlin, Germany — We report on the magnetic and phononic excitation spectrum of SrCrO determined by THz and infrared (IR) spectroscopy, specific heat, and electron spin resonance measurements. We identify the singlet-triplet excitations in the dimerized ground state and observe an extended temperature range $T^*(= 125 \text{ K}) < T < T_{JT}(= 285 \text{ K})$ below the Jahn-Teller transition, where the IR active phonons change only gradually with decreasing temperature. A clear anomaly in the specific heat marks the onset of orbital ordering at T_{JT} , but a detailed analysis of the orbital contribution to the specific heat shows the persistence of strong fluctuations down to T^* in agreement with the IR data. Due to these fluctuations we can observe electron spin resonance absorptions only below T^* with a linewidth $\propto \exp(-\Delta/k_B T)$ indicating an Orbach-type spin relaxation via the excited orbital state of the Cr e doublet split by $\Delta/k_B = 388 \text{ K}$.

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