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Optical properties of the 1D antiferromagnet $KCuF_3$ JOACHIM DEISENHOFER, Département de Physique de la Matière Condensée, Université de Genève, CH-1211 Genève 4, Switzerland, PAOLO GHIGNA, Dipartimento di Chimica Fisica, Università di Pavia, I-27100 Pavia, Italy, FRANZ MAYR, ALOIS LOIDL, Experimentalphysik V, Center for Electronic Correlations and Magnetism, Institute for Physics, Augsburg University, D-86135 Augsburg, Germany, DIRK VAN DER MAREL, Département de Physique de la Matière Condensée, Université de Genève, CH-1211 Genève 4, Switzerland — We present measurements of the optical properties of KCuF3, a paradigm for orbital ordering [1] and one of the best realizations of a quasi-one dimensional spin chain [2]. We can identify the d-d excitations on the Cu sites and the charge- transfer gap of the system. The observed crystal-field level splitting and the gap value will be compared to recent results obtained by LDA+U calculations [3]. Moreover, we find anomalies in the optical properties already above the magnetic phase transition. These features appear concomitantly with a change in the orbital order parameter as reported by resonant x-ray scattering [4] and indicate a symmetry change already above the Neel temperature [5]. [1] K. I. Kugel and D. I. Khomskii, Sov. Phys. Usp. 25, 231 (1982). [2] B. Lake et al., Nature Materials 4, 329 (2005). [3] S.V. Streltsov et al., Phys. Rev. B **71**, 245114 (2005); I. Leonov, unpublished. [4] L. Paolasini et al., PRL 88, 106403 (2002). [5] N. Binggeli and M. Altarelli, PRB 70, 085117 (2004).

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