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Magnetic and Orbital Ordering of $KCuF_3$ Studied by Soft X-ray Scattering C. H. LAI, Department of Physics, National Tsing Hua University, Hsinchu, Taiwan, W. B. WU, M. H. CHEN, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, T. C. HUNG, Department of Electrophysics, National Chao Tung University, Hsinchu, Taiwan, C. W. YUAN, Department of Physics, National Tsing Hua University, Hsinchu, Taiwan, D. J. HUANG, National Synchrotron Radiation Research Center, Hsinchu, Taiwan, Y. MURAKAMI, Condensed Matter Research Center and Photon Factory, Institute of Materials Structure Science, KEK, Tsukuba, Japan — The interplay between charge, orbital, and spin degrees of freedom plays an important role in the underlying physics of transition-metal compounds. The charge-transfer insulator $KCuF_3$ is an archetype of orbitally ordered materials with large exchange interaction energy. $KCuF_3$ has long been known to display quantum one-dimensional antiferromagnetic properties along the c-axis originating from the superexchange interaction between the e_g orbitals of Cu^{2+}. Due to the large Jahn-Teller distortion in the tetragonal structure, the degeneracy of the two e_g orbitals is lifted and the e_g orbitals form a pattern of orbital ordering . In this talk, we will present our recent measurements of spin and orbital ordering of $KCuF_3$ by soft X-ray scattering to address its magnetic transition and the coupling between spin and orbital degrees of freedom.

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