

Registration for the Spring-Meeting of the  
German Physical Society  
from 27.03. to 31.03.2006  
in dresden

**Polarization- and temperature-dependent Ru- $L_{2,3}$  XAS study of  $\text{Ca}_2\text{RuO}_4$**  — •T. BURNUS<sup>1</sup>, Z. HU<sup>1</sup>, T. T. TRAN<sup>2</sup>, T. MIZOKAWA<sup>2</sup>, H. H. HSIEH<sup>3</sup>, L.-Y. JANG<sup>4</sup>, S. NAKATSUJI<sup>5</sup>, Y. MAENO<sup>5,6</sup>, M. BRADEN<sup>1</sup>, K. S. LIANG<sup>4</sup>, and L. H. TJENG<sup>1</sup> — <sup>1</sup>II. Phys. Inst., Univ. zu Köln, Zülpicher Str. 77, 50937 Köln — <sup>2</sup>Dep. of Physics, Univ. of Tokyo, Bunkyo-ku, Tokyo 113, Japan — <sup>3</sup>Chung Cheng Inst. of Tech., National Defense Univ., Taoyuan 335, Taiwan — <sup>4</sup>Nat. Synchrotron Radiation Research Center, 101 Hsin-Ann Road, Hsinchu 30077, Taiwan — <sup>5</sup>Dep. of Physics, Kyoto Univ., Kyoto 606-8501, Japan — <sup>6</sup>Intern. Innov. Center, Kyoto Univ., Kyoto 606-8501, Japan

In the quasi-two-dimensional  $\text{Ca}_{1-x}\text{Sr}_x\text{RuO}_4$ , the strong correlations due to narrow electron bands and the active orbital degree of freedom yield a wide range of interesting properties.  $\text{Ca}_2\text{RuO}_4$  has a transition at 350 K from a paramagnetic metal to a paramagnetic insulator and, cooling further down, it turns at 110 K into an antiferromagnetic insulator. We carried out polarization- and temperature-dependent X-ray absorption spectroscopy (XAS) at the Ru- $L_{2,3}$  edges in order to determine the occupation of the Ru 4d orbitals and their changes crossing the phase transitions; until now the occupation has been only obtained from O- $K$  XAS, which contrary to the Ru- $L_{2,3}$  XAS only indirectly contains this information via the hybridization of the oxygen 2p with the ruthenium 4d orbitals. We observed the hysteretic change of the orbital occupation crossing the phase transitions. Furthermore, we confirmed the recently found additional phase transition around 260 K (Zegkkinglou *et al.* PRL, 2005).

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