Abstract Submitted
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First Observation of MCD at O and Ru sites in $Sr_4Ru_3O_{10}$ YINWAN LI, ZHIQIANG MAO, MENG ZHOU, DAVID EDERER, Tulane University, JOHN FREELAND, Argonne National Laboratory, TOM CALLCOTT, University of Tennessee — Perovskite strontium ruthenates of the Ruddlesden-Popper (RP) series $Sr_{n+1}Ru_nO_{3n+1}$show a variety of complex behavior including superconductivity and metamagnetism. $Sr_4Ru_3O_{10}$ is a trilayer member of the RP series with n=3 that is metamagnetic and shows an electronic phase separation[1]. We wanted to test if this material showed magnetic behavior at low fields and performed magnetic circular dichroism measurements (MCD) at the O K and Ru L edges. The measurements were carried out at the Sector 4 polarization beam line of the Advanced Photon Source at grazing (10°) and normal incidence angles at the characteristic temperature 50K below which metamagnetic behavior occurs[2] and above the ordering temperature (150K). We observed dichroic behavior at both temperatures although the dichroism was reduced by a factor of 10 at 150K relative to the measurements at 50K. It is significant to note that only the lowest unoccupied orbital (LUMO) associated with the planar O site showed dichroic behavior. This research was supported in part by DOE grant No. DE-FG02-05ER-46183, and the Advanced Photon Source is supported by DOE grant W-31-109-ENG-38.

1. Z.Q. Mao et al, submitted to Physical Review Letter.

2. G. Cao et al, Phys. Rev. B **68**, 174409 (2003)

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