

Abstract Submitted
for the MAR10 Meeting of
The American Physical Society

CeM₂Si₂ (M=Cu, Ru, Rh, Pd, and Au): a spectroscopic investigation of the crystal-field schemes applying polarized soft XAS and neutron scattering. ANDREA SEVERING, University of Cologne, Germany, DEVASHIBHAI ADROJA, ISIS Rutherford Lab., UK, THOMAS WILLERS, ZHIWEI HU, University of Cologne, Germany, LIU HAO TJENG, MPI Dresden, Germany — We have investigated the crystal field schemes of the CeM₂Si₂ series (M=Cu, Ru, Rh, Pd and Au) with linear polarized soft x-ray absorption spectroscopy (XAS) and inelastic neutron scattering. Within the series the ground states are antiferromagnetic, itinerant and/or superconducting at ambient or applied pressure. Soft-XAS at the Ce M_{4,5} edges can be used as a complementary technique to neutron scattering: while inelastic neutron scattering gives the crystal-field transition energies, the polarization dependence of XAS reflects the symmetry of the initial state and gives therefore direct information about the J_z admixtures of the ground state wave function. Crystal-field investigations of rare earth with XAS are not limited by energy resolution in contrast to what had been perceived in the past. This way we can provide spectroscopic information of the crystal-field schemes even in the presence of strong correlations.

Andrea Severing
University of Cologne, Germany

Date submitted: 01 Dec 2009

Electronic form version 1.4