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ARPES and spin resolved Investigations on the 8-1500 eV high resolution Cassiopée beamline at SOLEIL

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In this poster an overview of the performances of the high resolution Photoemission Beamline Cassiopée at SOLEIL will be shown.

This beamline is divided in two branches dedicated to High energy resolution ARPES and spin –resolved photoemission.

We will present an angle-resolved photoemission (ARPES) study of the low energy electronic structure of "misfit" cobaltates. Misfits are lamellar compounds, where metallic CoO_2 layers are separated by an "insulating" rock-salt structure, which acts as charge reservoir. The two sub-structures are generally incommensurate, this is why they are called misfit. In 2003, Takada et al. observed superconductivity along the same CoO_2 in $Na_{0.3}CoO_2{:}2H_2O$. Since then, the family of Na_XCoO_2, are heavily studied and showed a rich phase diagram in function of electron doping, from the Mott insulator limit (CoO_2) to the band insulator $NaCoO_2$. The "misfits" are located near the band insulator limit (X=0.7-1) and show coexistence of high thermoelectric power, good metallicity and Curie-Weiss susceptibility as Na cobaltates of the same doping. However, the transport properties suggest an evolution toward an insulating phase before the band insulator limit, not observed in Na cobaltates. We are interested in the comparison between the two systems to understand what is intrinsic of the metallic CoO_2 layers.

In addition, spin polarized photoemission data on Cassiopée allowing the determination of the polarization at the Fermi level in epitaxial FeV alloys, a step toward the understanding of the tunnel transport in MgO epitaxial junctions using these alloys as electrodes, will be shown.

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