



ID de Contribution: 419

Type: Poster

## Electronic structure of the metal-to-insulator transition in VO<sub>2</sub>

The strongly correlated material VO<sub>2</sub> displays a metal-to-insulator (MIT) transition when going below  $T_{MIT} = 280K$ . Alongside this electronic transition, the material undergoes a structural transition from a rutile structure in the metallic phase to a monoclinic structure in the insulating phase. These simultaneous transitions have created a long-lasting debate within the community: is the electronic transition induced by the structural changes (Peierls transition) or is it happening alongside it (Mott transition) [1]? This question has been nicknamed the chicken-and-egg dilemma [2] of condensed matter. Recent ARPES studies addressed the changes of the electronic structure of VO<sub>2</sub> across the transition [3].

However, a detailed imaging of the evolution of the conduction band spectral function in the transition regime is still lacking. I will present our ongoing ARPES studies on VO<sub>2</sub> where we were able to observe a progressive transfer of spectral weight between two distinct states composing the conduction band.

References:

- [1] Dynamical Singlets and Correlation-Assisted Peierls Transition in VO<sub>2</sub>, Silke Biermann et al., Physical Review Letters (2005)
- [2] Resolving the VO<sub>2</sub> controversy: Mott mechanism dominates the insulator-to-metal transition, O. Nájera et al., Physical Review B. (2017)
- [3] Photoelectron dispersion in metallic and insulating VO<sub>2</sub> thin films, Viktor Jonsson et al., Physical Review Research (2021)

### Affiliation de l'auteur principal

ISMO, Université-Paris-Saclay, Orsay

**Auteur principal:** DAVID, Emma (ISMO, Orsay)

**Co-auteurs:** SHIGA, Daisuke (KEK Photon Factory, Japan); JHA-THAKUR, Amitayush (ISMO, Orsay); THEES, Maximilian (ISMO, Orsay); HENRIQUE REZENDE GONÇALVES, Pedro (ISMO, Orsay); ANTEZAK, Alexandre (ISMO, Orsay); CHENG, Xianglin (KEK Photon Factory, Japan); KIM, Taehyun (KEK Photon Factory, Japan); KANDA, Tatsuhiko (KEK Photon Factory, Japan); FRANTZESKAKIS, Emmanouil (ISMO, Orsay); FORTUNA, Franck (ISMO, Orsay); MAYNE, Andrew (ISMO, Orsay); KUMIGASHIRA, Hiroshi (KEK Photon Factory, Japan); SANTANDER, Andres (ISMO, Orsay)

**Orateur:** DAVID, Emma (ISMO, Orsay)

**Classification de Session:** Session Poster 2: MC1, MC4, MC8, MC10, MC12, MC14, MC20, MC21, MC23, MC24, MC25, REDP

**Classification de thématique:** MC8 Dernières avancées dans le domaine des technologies quantiques