## **BPU11 CONGRESS**



Contribution ID: 98 Contribution code: S06-CMPSP-109

Type: Oral presentation

## The magnetothermopower of organic superconductor $\kappa - (ET)_2Cu(NCS)_2$ : possible charge density wave scenario

Tuesday 30 August 2022 14:30 (15 minutes)

The interlayer magnetothermopower of the organic superconductor  $\kappa - (ET)_2 Cu(NCS)_2$  is studied at temperatures down to 0.5 K and fields up to 32 T. Analysis of the background magnetothermopower show that at low temperatures it is negative and exhibits an upturn at higher field, producing a dip at a field close to the upper critical field  $B_{c2}$ . There are clear magnetothermopower quantum oscillations visible above 5 T. The obtained oscillation frequencies are in a good agreement with those previously reported on the magnetoresistance and magnetization quantum oscillations. According to our results, the magnetothermopower in  $\kappa - (ET)_2 Cu(NCS)_2$  presents features which have already been detected in YBCO and other high- $T_c$ cuprates indicating that some kind of a charge density wave order is also present in the normal state of  $\kappa - (ET)_2 Cu(NCS)_2$ . Most strikingly, our measurements show that there is another dip, again followed by an upturn, in the magnetothermopower of  $\kappa - (ET)_2 Cu(NCS)_2$  occurring at much higher fields than  $B_{c2}$ , around the magnetic breakdown field of ~ 21 T that is not present in YBCO. We propose that the two induced successive phase transitions, consisting of two similarly ordered states each restricted to a finite magnetic field window are in fact charge density wave ordered states arising as a result of the layer-stacking mechanism in the interlayer direction. Our results support and advance some of the previous findings that the superconductivity in the organic superconductor  $\kappa - (ET)_2 Cu(NCS)_2$  is mediated by a charge density wave order rather than antiferromagnetic fluctuation.

**Primary authors:** KRSTOVSKA, Danica (Ss. Cyril and Methodius University, Faculty of Natural Sciences and Mathematics); Dr STEVEN, Eden (Emmerich Research Center, Jakarta Utara, DKI Jakarta 14450, Indonesia); Dr CHOI, Eun Sang (National High Magnetic Field Laboratory, Florida State University, Tallahassee, FL 32310, USA)

**Presenter:** KRSTOVSKA, Danica (Ss. Cyril and Methodius University, Faculty of Natural Sciences and Mathematics)

Session Classification: S06 Condensed Matter Physics and Statistical Physics

Track Classification: Scientific Sections: S06 Condensed Matter Physics and Statistical Physics