Contribution ID: **90** Type: **not specified**

Topochemical synthesis of the 2M-WS_2

Tuesday, 29 October 2019 15:00 (30 minutes)

Transition metal chalcogenides (*TMCh*), which exhibit a wide spectrum of novel physical phenomena, are of vital importance in fundamental research and in many fields for future technological applications including spintronics, topological electronics, Motttronics, etc. Metastable, monoclinic tungsten diselenide (*2M*-WS_2) is the *TMCh* family member. It has been identify as a Dirac semimetal, exhibiting superconductivity and topological surface states [1]. Design, synthesis, and single crystal growth of the materials with a certain chemical stoichiometry and crystal structure play a key role in desire electronic phase realization. Preparation of a compound, with intriguing physical properties can be achieved by applying a unique set of optimized growth process conditions. We succeed to form *2M*-WS_2 phase by the topochemical synthesis method. Structural evolution trough a synthetic route and studies of superconducting state properties under ambient and elevated pressures will be presented.

---

[1] Zurab Guguchia, Dariusz J. Gawryluk, Marta Brzezinska, Stepan S. Tsirkin, Rustem Khasanov, Ekaterina Pomjakushina, Fabian O. von Rohr, Joel A. T. Verezhak, M. Zahid Hasan, Titus Neupert, Hubertus Luetkens, Alex Amato, "Nodeless superconductivity and its evolution with pressure in the layered dirac semimetal *2M*-WS_2", npj Quantum Materials 4 50 (2019)
https://doi.org/10.1038/s41535-019-0189-5

Position

Scientist

Primary author: Dr GAWRYLUK, Dariusz Jakub (Laboratory for Multiscale Materials Experiments, Paul Scherrer Institut, 5232 Villigen PSI, Switzerland)

Co-authors: Dr GUGUCHIA, Zurab (Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute); Dr KHASANOV, Rustem (Laboratory for Muon Spin Spectroscopy, Paul Scherrer Institute, CH-5232 Villigen PSI, Switzerland); Dr POMJAKUSHINA, Ekaterina (Laboratory for Multiscale Materials Experiments, Paul Scherrer Institut, 5232 Villigen PSI, Switzerland)

Presenter: Dr GAWRYLUK, Dariusz Jakub (Laboratory for Multiscale Materials Experiments, Paul Scherrer Institut, 5232 Villigen PSI, Switzerland)

Session Classification: Poster session

Track Classification: Poster