Contribution ID: **2** Type: **not specified**

Pressure induced superconductivity in a CeRhSi3 single crystal –the high pressure study

Friday, 18 September 2020 10:15 (15 minutes)

Pressure induced superconductivity in non-centrosymmetric CeRhSi₃ and CeIrSi₃ compounds has attracted significant attention of the scientific community since its discovery 15 years ago. Up-to-date, all reported experimental results were obtained employing the hybrid-cylinder piston pressure cells with a maximum reachable pressure of 3 GPa. Present study focuses on the superconducting state at higher, so far unreported, pressures using the Bridgman anvil cell and a CeRhSi₃ single crystal synthesized by the Sn-true-flux method. The initial increase of superconducting critical temperature from 0.4 K at 1.1 GPa to 1.1 K at 2.4 GPa is followed by a gradual suppression of SC state upon increasing the pressure above 3.0 GPa, forming a typical dome. The pressure induced superconductivity is expected to be completely suppressed in the pressure region between 4.5 and 5.0 GPa. Temperature dependence of electrical resistivity in constant magnetic fields and high pressures, as well as the magnetoresistance measurements, reveal a large critical field, exceeding 19 T at 0.6 K and 2.4 GPa, sharply decreasing receding the superconductivity dome. The previously reported *T-p* and *H-T* phase diagrams are completed by our high-pressure data and discussed in the frame of previous results.

Primary author: STAŠKO, Daniel (MFF UK)

Co-authors: VALENTA, Jaroslav; KRATOCHVÍLOVÁ, Marie; PRCHAL, Jiří; PROSCHEK, Petr; KLICPERA, Milan

Presenter: STAŠKO, Daniel (MFF UK)

Session Classification: Fyzika kondenzovaných látek

Track Classification: Fyzika kondenzovaných látek