



Contribution ID: 292

Type: Oral Presentation

The electrical and magnetotransport behaviour of layered tetragonal SrMn_2Ge_2

Tuesday 8 July 2025 16:50 (20 minutes)

ThCr_2Si_2 -type (space group: $I4/mmm$) materials have attracted a significant amount of interest in recent years because of the intriguing ground states and structure-property relationships exhibited by them. In particular, the AMn_2Ge_2 (A = alkaline earth metal or rare-earth metal) compounds have been shown to exhibit a wide variety of complex magnetic structures and unusual magnetotransport behaviours. In this work, we present the structural and physical properties of the unexplored compound SrMn_2Ge_2 using data obtained from x-ray diffraction, electronic and magnetotransport, thermal, and magnetic measurements. The Sommerfeld coefficient obtained from low-temperature heat capacity data shows a moderately enhanced density of states of 2.9(8) states/(eV f.u.) at the Fermi level in comparison to the values estimated from the band structure calculations. Furthermore, this compound exhibits an anomalously large positive magnetoresistance that approaches ~ 50 % at 2 K and deviates from Kohler's law, instead obeying a power law with an exponent of $n = 1.50(8)$. We discuss and compare our results with those reported for isostructural compound LaMn_2Ge_2 which shows similar magnetotransport behaviour.

Apply for student award at which level:

PhD

Consent on use of personal information: Abstract Submission

Yes, I ACCEPT

Primary author: VAN DER SPUY, Arthur (University of the Witwatersrand)

Co-authors: PANDEY, Abhishek (School of Physics, University of the Witwatersrand); Prof. STRYDOM, André (University of Johannesburg); WARMBIER, Robert (University of the Witwatersrand)

Presenter: VAN DER SPUY, Arthur (University of the Witwatersrand)

Session Classification: Physics of Condensed Matter and Materials

Track Classification: Track A - Physics of Condensed Matter and Materials