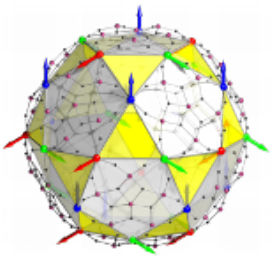

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Precise magnetic structure of CeRhIn5 from neutron diffraction on absorption optimized samples.

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CeRhIn5 is a prototypical strongly correlated metal attracting much attention because of it peculiar magnetic and electronic properties. However, despite the intense studies two aspects of the ambient pressure magnetic structure of this heavy fermion material have remained under some debate since its discovery: whether the structure is indeed an incommensurate helix or a spin density wave, and what is the precise magnitude of the ordered magnetic moment. Contradictory results on this regard were reported in the literature. On the other side, the precise knowledge of the magnetic structure is an important prerequisite for the detailed theoretical modelling on the microscopic level. We suppose, that certain discrepancies in the previous results may be caused by the parasitic effects like strong absorption for the thermal neutrons by the elements like In or Rh and large sample sizes used in the precedent studies. By using a single crystal sample optimized for hot neutrons to minimize neutron absorption we performed a series of polarised and non-polarised neutron diffraction experiments clearly revealing both the helical type of the magnetic structure, and magnitude of the ordered moment of m = 0.54(2) μB. Moreover, studied macroscopic sample surprisingly presents a single chiral domain.

Primary author: HUTANU, Vladimir

Co-authors: Dr FOBES, David (Los Alamos National Laboratory, USA); Dr SAZONOV, Andrew (RWTH aachen University, Germany); Dr JANOSCHEK, Marc (Paul Scherrer Institute, Viligen, Switzerland)

Presenter: HUTANU, Vladimir

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