



Contribution ID: 123

Type: Talk

Critical dynamics in Ca₂RuO₄ studied by neutron resonant spin-echo spectroscopy

Tuesday, 10 December 2019 16:15 (15 minutes)

We have used the spin-echo capabilities of TRISP at FRM-II to determine the linewidth of critical antiferromagnetic fluctuations in Ca₂RuO₄ (CRO) above the Néel temperature. CRO hosts a complex interplay between magnetic and electronic correlations, and exhibits a novel type of soft magnetism with strong single-ion anisotropy and 'Higgs' amplitude fluctuations in the spin-wave spectrum, as revealed by recent neutron experiments [1]. However, the nature of the electronic order in CRO above the Néel temperature is still under debate and the emergence of an exotic spin-nematic or an orbitally ordered state have been proposed [2,3]. Since the magnetic fluctuations are fundamentally related to the nature of the magnetism, with the magnetic order parameter possibly coupling to the electronic states, our investigation of the critical magnetic scattering might help to clarify the type of the electronic order in CRO.

- [1] A. Jain *et al.*, Nat. Phys. **13**, 633 (2017).
- [2] H. Liu and G. Khaliullin, Phys. Rev. Lett. **122**, 057203 (2019).
- [3] I. Zegkinoglou *et al.*, Phys. Rev. Lett. **95**, 136401 (2005).

Primary author: Dr HEPTING, Matthias (MPI für Festkörperforschung)

Co-authors: Mr TREPKA, Heiko (MPI für Festkörperforschung); Mr PORRAS, Juan (MPI für Festkörperforschung); Dr KRAUTLOHER, Maximilian (MPI für Festkörperforschung); Dr KELLER, Thomas (MPI für Festkörperforschung); Prof. KEIMER, Bernhard (MPI für Festkörperforschung)

Presenter: Dr HEPTING, Matthias (MPI für Festkörperforschung)

Session Classification: Quantum Phenomena

Track Classification: Quantum Phenomena