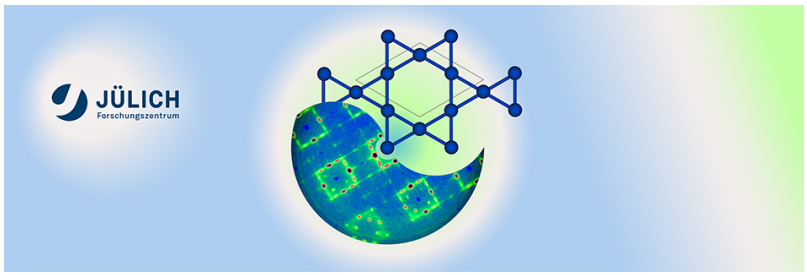

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Magnetic excitations in multiferroic Lu and Er rare earth orthoferrites for magnonic applications

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Rare-earth orthoferrites ($RFeO_3$, where R is a rare earth element) have been used as model systems in studies and theoretical considerations of magnetic structures since the 1960s [1]. Their complex multiferroic properties have made them potential candidates for modern applications, e.g. in the field of spintronics, and they have therefore regained considerable interest in the last years [2, 3, 4].
We investigated magnetic excitations in $ErFeO_3$ and $LuFeO_3$ using inelastic neutron scattering [5], the latter having only Fe as magnetic ions. The observed magnon dispersions and spectral intensities can be accurately reproduced within the framework of linear spin wave theory. This enables us to extract the key exchange parameters that govern the Fe–Fe interactions. In $ErFeO_3$, we modelled the Er^{3+} crystal field levels by refining a point-charge model guided by experimentally determined transition energies and their relative intensities.

[1] R. J. White, J. Appl. Phys., 40, 1061 (1969).
[2] J.-H. Lee et al., Phys. Rev. Lett., 107, 117201 (2011).
[3] Y. Tokunaga et al., Nat. Phys., 8, 838 (2012).
[4] J. Xu et al., Phys. Rev. Lett. 129, 117202 (2022).
[5] In preparation

Autoren: BHOSALE, Dnyaneshwar (Jülich Centre for Neutron Science JCNS at MLZ, Forschungszentrum Jülich); FABRYKIEWICZ, Piotr (RWTH Aachen and JCNS at MLZ)

Co-Autoren: Dr. MEVEN, Martin (JCNS-4); SCHNEIDEWIND, Astrid (JCNS at MLZ, FZ Jülich); Dr. NIKITIN, Stanislav (PSI); Dr. ADROJA, Devashibhai (ISIS); Dr. STAMPFL, Anton (ANSTO); STEKIEL, Michal (JCNS Forzschungszentrum Jülich GmbH)

Vortragende(r): Dr. MEVEN, Martin (JCNS-4)

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