

Neutron scattering experiments with pulsed magnetic fields — today and tomorrow

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The ability to reach high magnetic fields for neutron scattering experiments is invaluable to drive systems through phase transitions and thereby explore more quantum magnetic states. The theoretical description of the magnetic field in a material is exactly known and it is possible to accurately tune the field strength during an experiment. However, when performing neutron scattering experiments using traditional cryomagnets, the field strength is limited to around 15 T.

For higher fields, we need pulsed magnets and in my talk I will give an overview of the state-of-the-art at different neutron facilities. I will tell you about my experience using this technique and discuss the challenges we face before pulsed fields can become more user-friendly and accessible for neutron scattering experiments. I will also discuss desired capabilities for future setups, both in terms of maximum field strength, scattering geometries and integrated measuring times but also in combination with dilution temperatures or pressure as well as the possibility for specialised pulsed-field beamlines and inelastic experiments.