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## **A proposal: The next generation of sample environment magnets for the study of strongly correlated electron systems at MLZ**

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Strongly correlated electron systems (SCES) summarizes phenomena, which cannot be reconciled with the theory of the free electron gas. Instead, significant interactions between electrons are integral to understand these phenomena, mostly at very low temperatures when the impact of thermal fluctuations is low. On the atomic scale, properties like, e.g. spin orbit coupling, reduced magnetic dimensionality, low spin moments, spin dependent interaction of localized and itinerant electrons, quantum fluctuations or disorder form the ingredients of the zoo of SCES. This is why neutron scattering is indispensable for their study, as they probe the involved electronic states on the atomic scale.

Key to the investigation of SCES with neutrons is extending the available parameter space of the sample environment. Careful analysis of the status-quo at MLZ, the anticipated scientific challenges and needs, the recent technological revolution in magnet technology leads to the proposal of three new magnets:

- **A 10T asymmetric horizontal magnet for small angle neutron scattering** is focused on the use of polarized neutrons in forward scattering direction with both parallel and perpendicular access.
- **A 11T wide access vertical field TOF magnet with a large horizontal opening for time-of-flight (TOF) neutron scattering**, dedicated to the thermal TOF TOPAS and the upgraded TOFTOF.
- **A 6T horizontal magnet optimized for triple axis spectroscopy** with minimized dark angle coverage.

**Primary authors:** Dr FRANZ, Christian (Jülich Centre for Neutron Science); Dr BEDDRICH, Lukas (Research Neutron Source Heinz Maier-Leibnitz (FRM II)); SUAREZ ANZORENA, Manuel (Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM II)); WOLF, Marcell (TUM); SKOULATOS, Markos (TUM); MUEHLBAUER, Sebastian

**Presenter:** Dr BEDDRICH, Lukas (Research Neutron Source Heinz Maier-Leibnitz (FRM II))

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