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KOMPASS: The polarised triple-axis spectrometer (TAS)

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KOMPASS, a polarised triple-axis spectrometer (TAS), is one of the most recently built instruments at the FRM II. It is designed exclusively for polarised neutrons, benefiting from its uniquely designed polarising guide setup, which consists of static and exchangeable sections. The static part of the guide system hosts a series of three polarising V-cavities, yielding a highly polarised beam. The exchangeable straight and parabolic front-end sections of the guide system enable the instrument's resolution to be adapted for experiments, offering superior energy and Q resolutions compared to conventional guide and instrument concepts [1,2,3]. The secondary spectrometer offers exceptional flexibility, enabling fully and half-polarised measurements, with or without energy analysis. At the sample table, KOMPASS provides optimised options for spherical neutron polarimetry (SNP) using CryoPAD as well as XYZ polarisation analysis. While it is conceptualised as a primarily cold-neutron spectrometer its flexible guide setup and especially its highly polarised beam even at short wavelengths makes it an excellent choice also for diffraction studies on complex magnetic structures [3]. Potential science cases include for example helical orders, systems with small ordered moments, $q=0$ magnetic orders such as ferromagnets or more interestingly, the recently discovered family of altermagnets, which all rely on magnetic polarisation analysis to either determine magnetic moment directions directly or to disentangle nuclear and magnetic scattering to make small moments detectable. We will discuss the elastic and inelastic capabilities of KOMPASS when the FRM-II is operated without the cold source.

[1] M. Janoschek et al., Nucl. Instr. and Meth. A 613 (2010) 119.

[2] A. C. Komarek et al., Nucl. Instr. and Meth. A 647 (2011) 63.

[3] D. Gorkov et al., Nucl. Instr. and Meth. A 1080 (2025) 170719

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