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The bispectral chopper spectrometer T-REX

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T-REX is a bispectral direct geometry neutron chopper spectrometer, currently being constructed at the ESS. The instrument is a collaboration between Forschungszentrum Jülich and Consiglio Nazionale delle Ricerche (CNR).

T-REX is a very versatile instrument and will mainly focus on probing single crystals in the scientific areas of low dimensional, topological and frustrated materials, quantum magnets, high temperature superconductors, multifunctional oxides, and many more.

The instrument will measure a wide dynamic range with good wave-vector resolution over the energy transfer range from 20 μeV to 140 meV. Measurements will be supported in two modes, using polarized and non-polarized neutrons. Neutron polarisation is available for both cold and thermal neutrons. Thermal neutron polarization is achieved with the SEOP setup. Neutron spin analysis in XYZ is performed with the magic PASTIS setup.

The chopper system is specifically designed to make an efficient use of the flux provided by the source, by means of poly-chromatic illumination of the sample. It enables variable acquisition time frames, by means of a specially developed chopper (the FAN chopper) that suppresses selectively the sub-pulses generated by the resolution-defining choppers.

The secondary spectrometer features a vacuum path of 3 m from sample to detector, which will cover a dynamic range that extends from $0.05 \text{ \AA}^{-1} < Q < 10 \text{ \AA}^{-1}$, thus exploring a wide range of the reciprocal space.

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