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RESEDA: Resonance Spin Echo Spectrometer

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RESEDA (Resonance Spin Echo for Diverse Applications) is a high-resolution resonance spin echo spectrometer, operated by the Technische Universität München. It is situated at the end of neutron guide NL5-S at the cold source of the FRM-II research reactor in Garching Germany [1]. In contrast to classical neutron spin echo spectrometers, RESEDA realizes the spin precession by resonance coils rather than voluminous solenoids and thus allows besides spin echo spectroscopy also the use of the MIEZE (Modulation of Intensity by Zero Effort) mode [2]. This technique allows the investigation of quasi elastic scattering of depolarizing samples (i.e. strong incoherent scattering) or under depolarizing sample environments like magnets. Both options give access to a large time and scattering vector range for quasi-elastic measurements.

In a recent upgrade program, funded by the BMBF (BMBF-Projekt 05K16WO6: “Longitudinale Resonante Neutronen Spin-Echo Spektroskopie mit Extremer Energie Auflösung”), several components were renewed for a more robust operation and optimized to increase the accessible spin-echo times over more than 6 orders of magnitude (currently: $1 \times 10^{-5} \text{ ns} < \tau < 5 \times 10^1 \text{ ns}$).

The poster will present latest developments at RESEDA, few technical specifications and exemplary results for the determination of the diffusion constants in liquid bulk systems.

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