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MIASANS at the longitudinal resonant spin echo spectrometer RESEDA

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The RESEDA (Resonant Spin-Echo for Diverse Applications) instrument has been optimized for the measurement of quasi-elastic and inelastic processes over a wide parameter range. One spectrometer arm of RESEDA is configured for the MIEZE (Modulation of Intensity with Zero Effort) technique where two precisely tuned radio-frequency (RF) flippers prepare the neutron beam such that it yields a signal of time-varying neutron intensity oscillations. With MIEZE, all of the spin-manipulations are performed before the beam reaches the sample, and thus the signal from sample scattering is not disrupted by any depolarizing conditions there (i.e. magnetic materials). Currently a project is underway to optimize the MIEZE spectrometer for the requirements of small-angle neutron scattering (MIASANS), a versatile combination of the spatial and dynamical resolving power of both techniques. These upgrades include (i) installing new superconducting solenoids as part of the RF flippers to significantly extend the dynamic range (ii) design and installation of modular options for both reflecting guides and evacuated flight paths with absorbing walls for background reduction (iii) installation of a new detector on a translation stage within a vacuum vessel for flexibility in selecting both angular coverage and resolution. Current progress on each of these components will be presented.

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