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## New RF spin flippers for the MIEZE spectrometer RESEDA

*Tuesday 5 December 2023 14:00 (3 hours)*

Neutron resonant spin-echo (NRSE) and modulation of intensity with zero effort (MIEZE) are variants of the classical neutron spin-echo (NSE) technique, where the large static magnetic field precession coils are replaced with pairs of resonant spin flippers. They operate by producing a static magnetic field and a perpendicular radio frequency (RF) field to achieve a resonant neutron spin flip. This shifts the challenge of improving resolution from achieving strong, homogenous static fields, as is necessary for classical NSE towards the design and optimization of the RF coils and their corresponding matching circuitry.

Recent improvements at the RESEDA instrument at the Forschungs-Neutronenquelle Heinz Maier-Leibnitz (FRM2) have seen the replacement of the static field coils surrounding the RF coils with superconducting coils, which can reach higher fields, pushing the current RF flippers towards their limits. This necessitates the optimization of the RF flippers.

Here, we will discuss how we optimized the RF flippers using the simulation software “COMSOL Multiphysics” and we will present the design that resulted from these simulations.

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