

Optimization of Static Magnetic Fields for Neutron Science

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Abstract

Neutrons are a powerful research tool and provide scientists unprecedented insight into the structure and properties of materials. Experiments with spin-polarized neutrons demand sophisticated neutron optical devices embedded in tailored static magnetic fields. For this study we performed a depolarization analysis of a magnetic guide field interface of a neutron beam-line. By using the AC/DC module of COMSOL Multiphysics® the magnetic flux density and the corresponding neutron depolarization coefficient were calculated for a variety of guide field configurations. Based on this FE-analysis the magnetic-design of the neutron beam-line under investigation was successfully optimized.

Figures used in the abstract

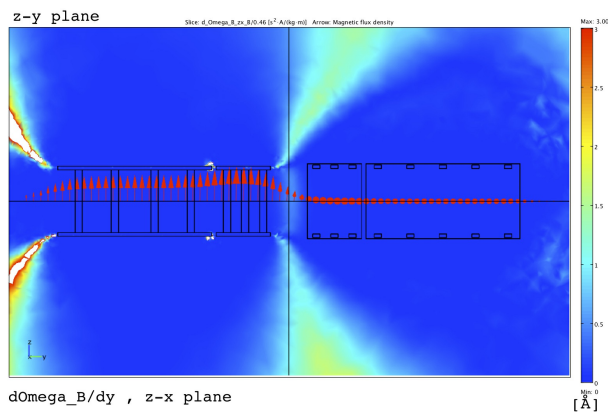


Figure 1: Critical neutron wavelength (z-y plane) for the optimized guide field configuration.