

Bachelor/Project Thesis

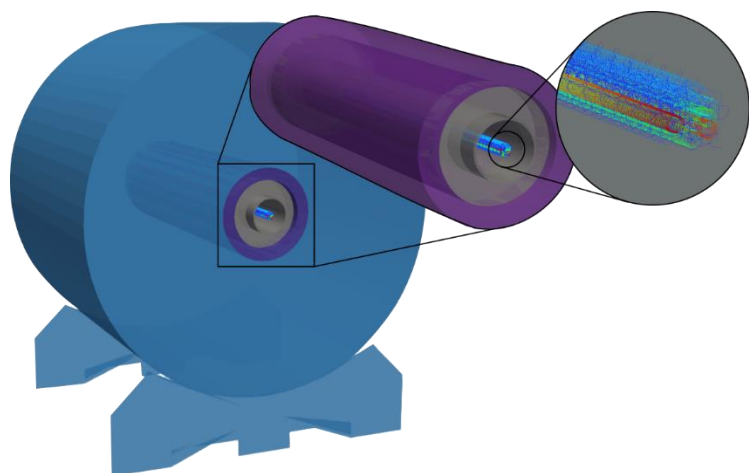
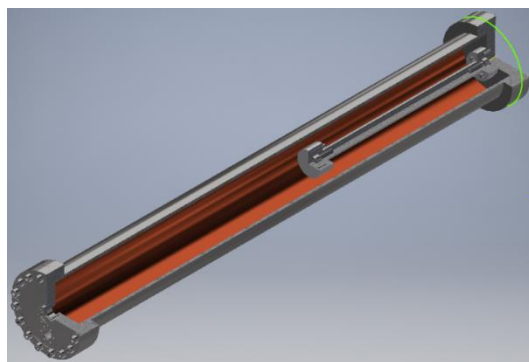
Homogenizing the magnetic field of a 4.7 T superconducting dipole magnet

21. Juli 2020

The primary goal of the thesis will be to measure the magnetic field homogeneity of a 4.7 T superconducting dipole magnet.

The dipole magnet is part of the Beta-Frequency experiment, a novel idea for a detector measuring electron energy. In this detector, the electron energy is not measured via absorption in a calorimeter, but via the cyclotron radiation emitted by electrons in a magnetic field.

The trajectory of the electron is therefore not impaired by the measurement.



In order to achieve a high frequency resolution in the cyclotron radiation signal, the magnetic field should be as homogenous as possible.

In a superconducting magnet, the magnetic field is fine-tuned using so-called shim-coils, small additional coils around the main coil.

During the course of the thesis, you will learn the procedures to operate a superconducting magnet, handle cryogenics (liquid nitrogen and helium) in order to maintain its temperature of 4K, as well as operate high current sources in order to charge superconducting coils.

Possible start date of the thesis:

Summer/Fall 2020

Kontakt:

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