

Workshop on Radiation Effects in Superconducting Magnet Materials 2015 (RESMM'15)

Contribution ID : 14

Reference Design of the Mu2e Production Solenoid

Monday 11 May 2015 at 13:45 (00h45')

Content :

The Mu2e experiment at Fermilab will measure the rare process of direct muon to electron conversion in a search for the first evidence of charged lepton flavor violation.

The Mu2e magnet system consists of three large superconducting solenoids. The first in the chain of magnets is the Production Solenoid (PS) designed to collect and focus pions and muons generated in interactions of an 8-GeV proton beam with a tilted high-Z target, by supplying a peak axial field between 4.6 and 5.0 T and an axial field gradient of approximately 1 T/m within a 1.5 m warm bore. The PS coil is protected by a massive bronze shield optimized to reduce the radiation load below the tolerable levels with a conservative safety margin.

A combination of a relatively high magnetic field together with the axial gradient and the radiation flux through the coil causing degradation of the stabilizer's electrical and thermal conductivity creates a challenging engineering task. This presentation describes the reference design of the PS and the supporting analysis. Work supported in part by FRA under DOE Contract DE-AC02-07CH11359.

Primary authors : KASHIKHIN, Vadim (Fermilab)

Co-authors :

Presenter :

Session classification : Session A: Superconducting Magnet Designs

Track classification : Design of Superconducting Magnets for High Radiation Environment

Type : Abstract