



Contribution ID: 18

Type: Oral contribution

Research and development of ceramic-insulated HTS magnets for high-radiation environments

Friday 17 January 2025 11:50 (20 minutes)

A construction plan for a second target station of Materials and Life Science Experimental Facility (MLF-TS2) has been proposed at J-PARC. At the MFL-TS2, which extracts a primary proton beam with a power of approximately 1 MW, a superconducting solenoid for a muon source is placed at the backward position particle generation target to maximize muon beam yield. The nuclear heating would be an extremely challenging for the superconducting solenoid: the absorbed dose of the solenoid reaches 100 MGy and the magnet system has to be operated under the heat load 450 W.

KEK has been performing research and development of mineral-insulated superconducting magnet based on REBCO conductors for the TS2 muon sources solenoid. The REBCO tapes, 4 mm wide and 40 m long, have been uniformly formed with an electrically insulating layer of about 0.03 mm thick by ceramic coating on both sides. Several prototype coils have been fabricated using the ceramic-coated conductors by wet-wound method with a commercial ceramic adhesive. In this contribution, the current status of ceramic coating on conductors and coil fabrication and the preliminary results of performance evaluation tests will be presented.

Author: IIO, Masami

Co-authors: SUZUKI, Kento; YOSHIDA, Makoto; SUGANO, Michinaka; Dr DHAKARWAL, Mukesh; NAKAMOTO, Tatsushi (KEK); OGITSU, Toru

Presenter: IIO, Masami

Session Classification: Design of superconducting magnets and shieldings for high-radiation environments