

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

Contribution ID : 10

Recent neutron irradiation experiments on HTS coated conductors and Nb₃Sn wires

Wednesday 13 May 2015 at 09:45 (00h45')

Content :

We report on our recent results of neutron irradiation experiments. These experiments aim at the assessment of the suitability of superconductors and insulation materials for fusion and accelerator magnets in view of their radiation robustness. The magnets in fusion devices will be exposed to neutron and gamma radiation, both with a similar energy distribution as in the fission reactor used for the irradiation experiments in this study. This makes a prediction of radiation effects on fusion magnets based on our data much more straightforward than for accelerator magnets, where a large variety of particle radiation is expected. Some of these particles have energies that are orders of magnitude higher than those of the neutrons in a fission spectrum. High temperature superconducting tapes from different companies and Nb₃Sn wires were used in our experiments. At low temperatures, all conductors show a similar behaviour. First, an increase in critical current up to about a fluence of $2 \times 10^{22} \text{ m}^{-2}$ followed by a decrease until degradation with respect to the pristine state occurs. The fluence at which the degradation starts decreases at higher temperatures.

Primary authors : Dr. EISTERER, Michael (Atominstitut, Vienna University of Technology)

Co-authors : PROKOPEC, Rainer (Atominstitut, Vienna University of Technology) ; FISCHER, David (Atominstitut, Vienna University of Technology) ; BAUMGARTNER, Thomas (Atominstitut, Vienna University of Technology) ; WEBER, Harald W. (Atominstitut, Vienna University of Technology)

Presenter : Dr. EISTERER, Michael (Atominstitut, Vienna University of Technology)

Session classification : Session C: Benchmark Experiments

Track classification : Benchmarking Experiments

Type : Abstract