

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

Contribution ID : 4

Study of the Displacement per atom in the n-alpha Reaction on MgB2 in the frame of Hi-Lumi LHC Project

Tuesday 12 May 2015 at 10:50 (00h45')

Content :

HiLumi LHC foresee many improvements on the machine.

Among them the removal of the power converters, feeding the magnets, from the tunnel and their location on surface.

The delivery of about 150kA to the magnets will be done through Superconducting Links (SCL) in MgB2.

The Links will be exposed to the radiation field of the debris from the Interaction Point (IP) and to the secondary generated particles. Among them neutrons are the main component (about 71% of the total).

The high cross section of ^{10}B for the neutron capture reaction need a careful analysis of the effects of this interaction, in order to guarantee a safe operation of the SC Links during the lifetime of the machine. The effect of the boron capture reaction (releasing a lithium nucleus and an alpha particle) on the SC Links and the induced DPA are presented.

Then simulation of irradiation test have been done, in order to evidence the relative contribution by the alpha particles and Lithium ion to the total DPA. The data of the simulation are then compared with irradiation tests.

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Type : Abstract