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# Radiation load studies for the proton target area of a multi-TeV muon collider

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Muon production in the multi-TeV muon collider studied by the International Muon Collider Collaboration is planned to be performed with a high-power proton beam interacting with a fixed graphite target. Capturing the emerging pions and muons requires very strong magnetic fields that can only be reached with superconducting solenoids, whose properties are sensitive to long-term radiation damage. The design must ensure that the induced radiation damage is compatible with the operational lifetime of the muon production complex. One of the main concerns of the target area design is the displacement damage in the superconductor. Next to that, the fraction of the primary beam passing through the target unimpeded must be safely extracted onto an external beam dump. In this study, we use the FLUKA Monte Carlo code to assess the radiation load to the target solenoids and we explore the spent proton beam extraction scenarios considering the desired muon spectrum.

## Scientific Topic 1

## Scientific Topic 2

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Radiation damage to materials

## Scientific Topic 7

## Scientific Topic 8

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