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First Attila4MC simulations for the high-power proton accelerator of the European Spallation Source

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Radiation transport simulations allow the design and operation of entire facilities such as the European Spallation Source (ESS) in Lund, Sweden.
This paper summarizes three of the first applications of Attila4MC simulations to the high-power proton accelerator of ESS and its beam instrumentation. Entire linac sections and beam-interceptive instrumentation were modelled by implementing existing CAD models, relying on unstructured tetrahedral meshes and zeroing out the time spent in manually crafting MCNP6 models. As a result, it was possible to accurately quantify the beam power density within beam-interceptive devices and in turn their operational limits. Activation and 3D dose maps were computed and swiftly visualized in 3D, on top of the actual linac model. This work paves the way for e.g. advanced instrumentation design, linac operation, safe maintenance, categorization of radiation waste and future dismantling.

Footnotes

Funding Agency

I have read and accept the Conference Policies

Yes

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