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Benchmarking the FLUKA predictions of the neutron flux delivered at the INES instrument and envisaged solution for reducing the background.

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INES is a powder diffractometer operated at ISIS, in which thermal and epithermal neutrons are used to study elemental and isotopic composition of materials, with special application to cultural heritage studies.

In this talk we present the comparison of the average neutron fluence rate measured at INES with the predictions based on the FLUKA_CERN simulations.

The total integrated flux, the full energy spectrum and the spatial distribution of neutrons at the sample location have been calculated by coupling the FLUKA_CERN model of the ISIS Target Station 1 with the Mcstas instrument beam line one.

Particularly interesting is the benchmarking of the predictions in the epithermal region of the neutron spectrum for its peculiar fundamental relevance for the INES beam line.

A practical solution to reduce the background is also analysed and suggested as a valuable option of whom all the instruments fed by the water moderators in the ISIS-TS1 experimental hall could eventually benefit.

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