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Neutron simulation studies and their implications for CRESST

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The CRESST-III experiment specialises on the direct search for low-mass dark matter. The analysis of the CaWO₄ detector called “detector A”, operated in Run34, provided world-leading limits in the sub- GeV mass range. To interpret the residually observed events, the existence of a background model is crucial. Neutron-induced nuclear recoils are similar to the sought-for DM-induced nuclear recoil signal and as such, they are an important ingredient to this model.

In this contribution, we present the simulation based neutron background model for the CRESST-III experiment, in the context of the published detector A results, and discuss the probability of obtaining a nuclear recoil contribution to the residual events.

Furthermore, a simulation of the neutron calibration revealed interesting features in the energy deposition spectrum due to thermal neutron capture reactions. A discussion of these features and their potential purpose in future experimental runs is additionally discussed in this poster.

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