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Neutron production in simulations of extensive air showers

We study neutrons produced in simulations of extensive air showers. By using the Monte Carlo simulation package FLUKA, our examination is able to extend from the highest energy neutrons down to thermal energies. Their longitudinal profiles as well as lateral distributions and arrival times at different atmospheric depths are juxtaposed for different primary species and are interpreted in the context of the distinct production mechanisms. Direct comparisons are also drawn with the analogous distributions for muons.

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