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First muon-induced neutron yields from NEMESIS experiment

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The NEMESIS experiment (New Emma MEasurement with neutronS In cosmic Showers) is located in Pyhasalmi Mine (Finland), and operates at a depth of 75 m (210 m.w.e.), corresponding to 50 GeV cutoff energy for vertical muons.

The experiment consists of a pixelized (11cm x 11cm) scintillation telescope, 14 helium counters, 2 1m^2 scintillating detectors, and Pb target. The scintillation telescope detect the cosmic ray muons passing through the Pb-target, while the helium counters detect the neutrons produced in Pb. The aim of the experiment is to precisely investigate production of neutrons and check whether it is well described by simulations. This is important for experiments which look for rare phenomenas, as the detector shelters are often made of lead.

Detector was measuring for one year. One of the parameter is neutron yield per muon. Preliminary analysis of our data show the yield equal to 4.5 (+/- 0.5) e-4 per square centimeter per gram or the mean for muon energy = 50 GeV. This result is similar to yields reported in the literature.

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other Collaboration

NEMESIS

Subcategory

Experimental Results

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