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Study of muon-induced background in MMC detector arrays for the ECHo experiment

For aboveground experiments, cosmic muons are common background sources. The ECHo experiment is designed for the determination of the effective electronneutrino-mass by the analysis of the endpoint region of the ^{163}Ho EC spectrum. The fraction of events in the ROI below the Q_{EC} value is of the order of 10^{-12}. Thus, the background in that region requires a precise understanding and possible reduction. We present the role of muon-related events in metallic magnetic calorimeter (MMC) arrays used for ECHo and discuss the use of an active muon veto. Muon-related events are used to study the pulse shape and multiplicity in array pixels. We report on different families of muon-related events in MMC pixels and analytical identification and eliminatation methods. The spectrum of muon-related events shows a decreasing energydistribution with energy. Presently, we conclude that muon-related background is negligible in the ROI.

Mini-abstract

Muonic backgound source in the ECHo experiment neglible, according to pulse shape analysis.

Experiment/Collaboration

ECHo experiment

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