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On the Combined Analysis of Muon Shower Size and Depth of Shower Maximum

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The mass composition of ultra-high energy cosmic rays can be studied from the distributions of the depth of shower maximum and/or of the muon shower size. We study the dependence of the mean muon shower size on the depth of shower maximum in more details. Air showers induced by four different primaries were simulated with two models of hadronic interactions already tuned with LHC data. The generated air showers were combined to obtain various types of mass composition of the primary beam. We investigate the shape of functional dependence of the mean muon shower size on the depth of shower maximum and its dependency on the composition mixture and resolution of the measurement.

Collaboration

– not specified –

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