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A study of the capability of the LHAASO experiment to separate primary mass groups samples

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The LHAASO experiment will operate in the Sichuan province (China) at high altitude (4410 m $a.s.l.$) sampling the electromagnetic and muonic EAS components in a 1 km^2 surface with an unprecedented high ratio between the active and the effective area. The EAS electromagnetic component will be measured by 5635 1 m^2 plastic scintillator detectors and the muonic one by 1211 water cherenkov detectors, 3.6 m radius and 1.2 m high each, buried 2.5 m underneath the ground surface.

In this contribution we present the experiment capabilities of separating, by mean of the ratio between the muon and electron numbers at observation level, at least two mass groups in the $10^{14} - 10^{17} eV$ energy range. The study has been performed by mean of a complete EAS simulation for fixed primary energy and fixed zenith angle, using the CORSIKA code and the QSGJetII-04 hadronic interaction model. Therefore current results represent only the first step toward a complete discussion. We will show that an experiment operating at high altitude (i.e. near to shower maximum) will separate, in this energy range, at least two mass groups (i.e. the light and the heavy ones) with high efficiency, the percentage of events wrongly classified will be discussed.

Collaboration

LHAASO

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