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Type: Talk

The ACROMASS project for the study of the charged components of the atmospheric cosmic radiation

Wednesday 23 July 2025 18:30 (20 minutes)

Although various measures of atmospheric muons have been conducted between the 60s and 80s of the last century, the study of these particles is still of interest in two different fields of physics. The first is related to neutrinos. The precise measurement of the parameters that describe the phenomenon of oscillation between the three families of neutrinos known so far, through the study of atmospheric neutrinos, requires a precise estimate of the production energy and angular spectra of these particles, that can be obtained with detailed simulations calibrated with precise measurements of atmospheric muons spectra. The second is muon radiography, an imaging technique that uses atmospheric muons to produce radiographic representations of enormous volumes of materials and which requires the use of reliable simulations of the fluxes of atmospheric muons and their absorption inside materials.

Between the late 90s and the beginning of the 2000s, the INFN section of Florence and the Department of Physics of the University of Florence developed the ADAMO magnetic spectrometer, a test system for the preparation of the PAMELA satellite experiment. ADAMO was used in 2004 for a measurement of the inclusive momentum spectrum of cosmic rays at ground level at several zenith angles in the momentum range between 100 MeV/c and 130 GeV/c. Results were presented at the 29th ICRC held in Pune (India).

The ACROMASS project, started in 2024, was funded by INFN for the enhancement of the ADAMO spectrometer and its completion with two auxiliary sub-detectors for particle identification (PID). The new apparatus will be used to measure atmospheric muons at different altitudes and latitudes in the momentum range between 100 MeV/c and 200 GeV/c and will also allow the study of the rarest charged components of cosmic rays at ground level.

References.

- [1] M. Honda et al., PHYSICAL REVIEW D 100, 123022 (2019)
- [2] L. Bonechi et al., Reviews in Physics 5 (2020) 100038
- [3] L. Bonechi et al., Proceedings of 29th ICRC, Pune, India (2005), pp. 283-286

Internet talk

Maybe

Is this an abstract from experimental collaboration?

Yes

Name of experiment and experimental site

ACROMASS (no website available yet)

Is the speaker for that presentation defined?

No

Details

The speaker has not been defined yet.

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