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The Underground Muon Detector of AugerPrime

Monday 21 August 2023 09:00 (20 minutes)

The Pierre Auger Observatory was built to study ultra-high-energy cosmic rays. It has a hybrid design that allows one to observe the main features of extensive air showers with unprecedented precision. However, these discoveries have opened new questions about the nature of cosmic rays. One of the most intriguing is the discrepancy between the observed number of muons and the expected value from the more updated hadronic interaction models. Therefore, the design of AugerPrime, the upgrade of the Pierre Auger Observatory, includes the installation of a new detection system, the Underground Muon Detector (UMD), to perform a direct measurement of the number and temporal distribution of muons in extensive air showers. This presentation will be an overview of the main characteristics of the Underground Muon Detector: final design and deployment status, as well as the calibration and reconstruction processes. Furthermore, the first results obtained during the engineering array phase will be presented, showing the contribution of the UMD to solving the still open questions about cosmic ray physics.

Collaboration / Activity

Pierre Auger Observatory

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