Contribution ID: **84** Type: **Oral**

AugerPrime: the Pierre Auger Observatory upgrade

Monday, 23 May 2022 11:00 (15 minutes)

After more than 15 years of successful data taking, the Pierre Auger Observatory started a major upgrade, called AugerPrime, whose main aim is the collection of new information about the primary mass of ultrahigh-energy cosmic rays (UHECRs), besides adding new indications on hadronic interactions at UHE.
The upgrade program includes: the installation of plastic scintillator detectors (SSDs) on top of each water-Cherenkov detector (WCD) of the surface array; new electronics to process signals from the WCD and the SSD with higher sampling frequency and enhanced resolution in amplitude; an extension of the dynamic range of measurement through an additional small photomultiplier tube in the water-Cherenkov tank; an array of underground scintillator detectors to measure the muonic component of extensive air showers; the deployment of a radio antenna atop each WCD.
After presenting the motivations for upgrading the Observatory, an overview of the detector upgrade is provided, together with the expected performances and the improved physics sensitivity. The first results from the data collected with the already upgraded AugerPrime stations are presented and discussed.

Collaboration

Pierre Auger Collaboration

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Session Classification: Detector Systems and Future accelerators