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AugerPrime, the upgrade of the Pierre Auger Observatory: current status and data taking

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The Pierre Auger Observatory, designed for research of ultra-high-energy cosmic rays (UHECRs), has been collecting data since early 2004 and was completed in 2008. It is located at 1400 m above sea level near Malargüe, Mendoza, Argentina, covering a vast plain of about 3000 square kilometers, known as the Pampa Amarilla. The Observatory consists of a hybrid detector, composed of 1660 water-Cherenkov stations, which form the Surface Detector and 27 peripheral atmospheric fluorescence telescopes, which comprise the Fluorescence Detector. Over time, the Observatory has undergone enhancements with various R&D prototypes. Since 2016, it has been subjected to a significant and well-structured upgrade. The installation of different detectors - including the Radio Detector (RD), the Surface Scintillator Detectors (SSD), the Underground Muon Detector (UMD) - plus a Small PMT (SPMT) in the existing water-Cherenkov stations, in addition to the Upgraded Unified Board (UUB) to handle all the newly installed systems, forms the whole upgrade, known as AugerPrime. As the commissioning of the final components of AugerPrime approaches its completion and the upgraded array becomes fully operational, the Observatory has started acquiring data with the enhanced instrumentation. The entire area is now equipped with SSDs, SPMTs, UUBs, and RDs, while the deployment of the UMD is nearing completion. In this contribution, we provide a general overview of AugerPrime, highlighting its potential to deepen our understanding of the nature and origin of UHECRs. We also discuss the current status of the Observatory, focusing on performance, data quality, and first results.

Collaboration you are representing

on behalf of the Pierre Auger Collaboration

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