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Expected performance and first results of the Radio Detector of the Pierre Auger Observatory

Monday 5 September 2022 15:30 (20 minutes)

The Pierre Auger Observatory is currently the world's largest detector for cosmic rays at the highest energies investigating their properties with unprecedented precision. The AugerPrime upgrade aims to enable mass sensitivity on an event-by-event level. Part of this upgrade is a Radio Detector (RD) that will increase the sky coverage of mass-sensitive measurements by measurements of inclined air showers with zenith angles between 65° to 85° by adding a radio antenna to each water-Cherenkov detector (WCD) station. The combination of radio and particle measurements allows the separation of the electromagnetic and muonic components of the air shower. This is a key ingredient for the understanding of the flux suppression at the highest energies. We will present the first results of an end-to-end simulation study for the performance of the RD. The potential to discriminate two different astrophysical source scenarios by their mass composition with the expected 10-year event statistics is shown. An engineering array with ten RD stations is installed in the field since fall 2019 to verify the calibration and air shower reconstruction procedures. The engineering array is fully integrated into the central data acquisition system and continuously records air showers. The first air showers detected simultaneously with the WCD and the RD will be presented. A comparison of measured radio signal per station and the prediction of CoREAS simulations based on the WCD reconstruction as input is shown.

Is this abstract from experiment?

Yes

Name of experiment and experimental site

Pierre Auger Observatory, Malargüe, Argentina

Is the speaker for that presentation defined?

Yes

Details

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Internet talk

No

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