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The Radio Detector upgrade of the Pierre Auger Observatory

Friday 31 July 2020 12:00 (15 minutes)

Ultra-high-energy cosmic rays (UHECR), of energy >10 EeV, arrive at the Earth regularly, but their sources, acceleration mechanisms, propagation through the universe, and particle composition remain mysteries. In addition, their interactions with the atmosphere show an unexpectedly high muon flux compared to simulations.

To address these issues, the Pierre Auger Observatory, a hybrid 3000 km2 ground based cosmic ray detector, is upgraded, notably adding a completely new detection layer to measure the radio frequency emission of extensive air showers.

Based on the Auger Engineering Radio Array and other radio arrays, the expected performance of this Radio Detector is similar in precision to existing ground array techniques and will provide novel measurements for inclined showers, complementary to the other techniques.

Design and production of the full 1660 station Radio Detector upgrade will be presented, as well as the expected reach in addressing the open questions in UHECR astroparticle physics.

Secondary track (number)

12 & 8

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