

The low-energy extensions of the Pierre Auger Observatory

Abstract content

The Pierre Auger Observatory was designed to measure ultra-high energy cosmic rays above 10^{18} eV with high accuracy using a hybrid air shower detection technique. A Surface Detector (SD) with 1600 water-Cherenkov stations on a 1500 m triangular grid covers an area of 3000 km². The atmosphere above the array is viewed by a Fluorescence Detector (FD) with 24 telescopes at 4 sites in the periphery of the SD. As an enhancement to this baseline design, in order to reach a lower energy threshold below 10^{17} eV, the Collaboration has implemented extensions to the Observatory. The SD extension is AMIGA (Auger Muons and Infill for the Ground Array), an infilled area with detectors at a smaller spacing than in the main array and with buried scintillator counters. The FD is complemented by HEAT (High Elevation Auger Telescopes), with 3 additional telescopes that are tilted upwards to extend the elevation range. The importance of these extensions of the Auger Observatory is that they allow to study the energy range where the transition from a Galactic to an extra-Galactic origin of cosmic rays may occur. The current status and initial results from these extensions are discussed.

Summary

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