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New electronics for the surface detectors of the Pierre Auger Observatory

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The surface detector array of the Pierre Auger Observatory consists of 1660 water Cherenkov detectors that sample the charged particles and photons of air showers initiated by energetic cosmic rays at the ground. Each detector records data locally with timing obtained from GPS units and power from solar panels and batteries. In the framework of the planned upgrade of the Auger Observatory, new electronics has been designed for the surface detectors. The electronics upgrade includes better timing with up-to-date GPS receivers, higher sampling frequency, increased dynamic range, increased processing capability, and better calibration and monitoring systems. It will also process the data of the additional scintillator detectors planned for the upgrade. In this paper, the design of the new electronics will be presented and its performance will be discussed.

Collaboration

Pierre Auger

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