



Contribution ID: 46

Type: poster

AugerNext: Innovative Research Studies for the Next Generation Ground-Based Ultra-High Energy Cosmic-Ray Experiment

Andreas Haungs and the AugerNext consortium for the Pierre Auger Collaboration

The findings so far of the Pierre Auger Observatory and the Telescope Array define the requirements for a possible next generation experiment: it needs to be considerably increased in size, it needs a better sensitivity to composition, and it should cover the full sky. AugerNext aims to perform innovative research studies in order to prepare a proposal fulfilling these demands. Such R&D studies are primarily focussed in the areas i) consolidation of the detection of cosmic rays using MHz radio antennas; ii) proof-of-principle of cosmic rays microwave detection; iii) testing the large-scale application of new generation photo sensors; iv) generalisation of data communication techniques; and v) developing new ways of muon detection with surface arrays. These AugerNext studies for a next generation cosmic ray experiment and the utilization of such new innovative detection methods are performed at the Pierre Auger Observatory. The AugerNext consortium consists presently of 14 partner institutions from 9 European countries supported by a network of European funding agencies and is a principle element of the ASPERA/ApPEC strategic roadmaps.

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