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AugerNext: R&D studies at the Pierre Auger Observatory for a next generation ground-based ultra-high energy cosmic ray experiment

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The findings so far of the Pierre Auger Observatory and those of the Telescope Array define some requirements for a possible next generation global cosmic ray observatory: it needs to be considerably increased in size, it needs good sensitivity to composition, and it has to cover the full sky. At the Pierre Auger Observatory, AugerNext aims to conduct some innovative initial research studies on a design of a sophisticated hybrid detector fulfilling these demands. Within a European supported ASPERA/APPEC (Astroparticle Physics European Consortium) project for the years 2011-2014, such R&D studies primarily focused on the following areas: i) consolidation of the detection of cosmic rays using MHz radio antennas; ii) proof-of-principle of cosmic ray microwave detection; iii) test of the large-scale application of new generation photo-sensors; iv) generalization of data communication techniques; and v) development of new schemes for muon detection with surface arrays. This contribution summarizes the achievements of these R&D studies within the AugerNext project.

Collaboration

Pierre Auger

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Author: HAUNGS, Andreas (Karlsruhe Institute of Technology)

Presenter: HAUNGS, Andreas (Karlsruhe Institute of Technology)

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