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Extensive Air Shower and cosmic ray physics above 10^17 eV

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Cosmic Rays above 10^17 eV allow studying hadronic interactions at energies that can not be attained at accelerators yet.
At the same time hadronic interaction models have to be applied to
the cosmic-ray induced air-shower cascades in atmosphere to infer the nature of cosmic rays. The reliability of air-shower simulations has become the source of one of the largest systematic uncertainty in the interpretation of cosmic-ray data due to the uncertainties in modeling the hadronic interaction driving the air-shower development.
In this presentation a review will be done on the current understanding of the nature of cosmic rays above 10^17 eV, and on role of air showers as probes to test hadronic interaction models at energies well beyond those achieved at accelerators.

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