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Ultra-high energy cosmic ray physics in the post-LHC era

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With the LHC basically reaching its design beam energy the measurements most relevant for the cosmic ray community are becoming available. First data do not indicate major difficulties within the existing interaction models. An eventual new generation of updated models to describe LHC data at 13TeV will further lower the model discrepancies at ultra-high energies. The cosmic ray community has to face two facts: firstly, there will be no further accelerator data at higher center-of-mass energies over a long time scale, secondly, there are still significant uncertainties in the modelling of air-showers originating from phase-space regions so far not explored sufficiently. There should be made all possible efforts to address the latter point with dedicated forward-data from LHC, with fixed target experiments at LHC, and with light-nuclei collisions in the LHC.

Primary author: ULRICH, Ralf (KIT)

Presenter: ULRICH, Ralf (KIT)

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