

The 2021 Open-Data release by the Pierre Auger Collaboration

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The Pierre Auger Observatory is used to study the extensive air-showers produced by cosmic rays above 10^{17} eV. The Observatory is operated by a Collaboration of more than 400 scientists, engineers, technicians and students from more than 90 institutions in 18 countries.

The Pierre Auger Collaboration is committed to the public release of data for the purpose of re-use by a wide community including professional scientists, in educational and outreach initiatives, and by citizen scientists.

The 2021 Open Access release of data collected at the Observatory consists of 10% of the samples used for results reported at the International Cosmic Ray Conference 2019. This fraction amounts to more than 20000 showers measured with the surface-detector array and more than 3000 showers recorded simultaneously by the surface and fluorescence detectors. Data are available in pseudo-raw (JSON) format and as a summary CSV file containing the reconstructed parameters.

A dedicated website is used to host the datasets that are available for download. Their detailed description, along with auxiliary information needed for data analysis, are given. An online event display is also available. Simplified codes derived from the ones used for published analyses are provided by means of Python notebooks prepared to guide the reader to an understanding of the physics results.

In this paper, we describe the data that is being released, discuss the notebooks available and show some of the material that is immediately accessible to the user at <https://www.auger.org/opendata>.

Keywords

Ultra-high energy cosmic rays; Pierre Auger Observatory; Open-data release; Surface detector and hybrid datasets; Reconstructed open data; Raw open data; Data and analysis tools; Events visualization;

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