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Questions and answers on extreme energy cosmic rays: A guide to explore the public data set of the Pierre Auger Observatory

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The Pierre Auger Observatory is the largest extensive air shower detector, covering 3000 km² in Argentina. The observatory makes available, for educational and outreach purposes, 1% of its cosmic ray data set, which after 10 year of running corresponds to more than 30000 cosmic ray events. Several different proposals of education activities have been developed within the collaboration and are available. We will focus on the activity guide we developed with the aim of exploring the rich education and outreach potential of cosmic rays with Portuguese high-school students.

In this guide we use the Auger public data set as a starting point to introduce open questions on the origin, particle type and spectrum of high energy cosmic rays. To address them, the students learn about the air-shower cascade development, data reconstruction and its statistical analysis.

The guide has been used both in the context of student summer internships at research labs and directly in schools, under the supervision of trained teachers and in close collaboration with Auger researchers. It is now available in Portuguese, English and Spanish.

Summary

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