Search for upward-going showers with the Fluorescence Detector of the Pierre Auger Observatory

Executive Summary

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What is this contribution about?

The contribution presents the preliminary results of a generic search for cosmic-ray-like upward-going showers performed with the Fluorescence Detector (FD) of the Pierre Auger Observatory.

Why is it relevant/interesting?

The ANITA Collaboration has recently reported two events that are consistent with the interpretation of upward-going air showers. These two events appear challenging to reconcile with the predictions of the standard model of particle physics, so a confirmation or a constraint from a different experiment is of particular interest.

What has been done?

A blinded analysis to distinguish candidates from false positives, calculate the exposure, and estimate the expected background was performed simulating both signal and background events. A sample of 10% of the available FD data was used to clean the data from improperly labelled laser events. A set of selection criteria was defined and then applied to the full data sample during the unblinding of the data.

What is the result?

After unblinding, the number of observed events was consistent with the one expected from the background. An integral upper flux limit was set. Differential tables of exposure, which make the result of this search applicable to different physical scenarios, were provided.