

Search for upward-going air showers with the fluorescence detector of the Pierre Auger Observatory

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The fluorescence detector (FD) of the Pierre Auger Observatory is sensitive to upward-going air showers for energies above 10^{17} eV. Given its operation time and wide field of view, the FD has the potential to support or constrain the recent “anomalous” observations by the ANITA detector, interpreted as upward-going air showers of unexplained nature.

We have used 14 years of data collected by the FD to search for upward-going showers using a set of quality selection criteria defined using 10% of the full data sample.

To distinguish candidates from false positives, calculate the exposure and obtain the expected background, dedicated simulations for signal (upward-going events) and background (downward-going events) have been performed.

Results of the analysis after unblinding the data set are presented.

Finally, the exposure and sensitivity for the specific scenario of a signal being ascribed to tau lepton decay are calculated and the corresponding upper limits are shown as a function of primary energy and in different zenith angle ranges.

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