

Detailed temporal structure of multiple ELVES recorded at the Pierre Auger Observatory

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The Pierre Auger Observatory, located in Malargüe (Argentina), is the largest facility (3000 km²) for the study of Ultra High Energy Cosmic Rays.

Since 2013, the four sites of the Fluorescence Detector (FD) record ELVES with a dedicated trigger. These UV light emissions are correlated to distant lightning strikes. The length of recorded traces has been increased from 100 μ s (2013), to 300 μ s (2014-16), to 900 μ s (2017-present), to progressively extend the observation of the light emission towards the vertical of the causative lightning, and beyond. A large fraction (about one third) of the observed events shows double ELVES within the time window, and in some cases even more complex structures are observed. This report will show the seasonal and daily dependence of the time gap, amplitude ratio, and correlation of the pulse width of the first and second peak in a sample of about five hundred multiple ELVES events recorded during the period 2014-6.

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