

## Auger Youngsters Meeting 2024 (Siegen)



Contribution ID: 19

Type: **not specified**

# Absolute energy calibration of the Fluorescence Telescopes at the Pierre Auger Observatory with a roving laser system

*Thursday 5 September 2024 14:10 (20 minutes)*

The Fluorescence Detector (FD) of the Pierre Auger Observatory provides energy measurements of primary cosmic rays that are largely independent of specific models. These FD energy measurements are crucial for calibrating the energy reconstruction process of the Surface Detector. Consequently, the accuracy of the FD energy calibration plays a significant role in the systematic uncertainties associated with nearly all scientific results from the Observatory. To achieve high precision in calibration, a laser with a well-defined energy output is fired in front of the FD telescopes. This method has the advantage that the camera's response to the laser closely simulates its reaction to an actual cosmic ray air shower, something that is difficult to achieve with other calibration methods.

The system, originally developed by Alina Esfahani, was designed with special attention given to the depolarization of the laser beam to ensure a consistent relationship between energy output and directional light emission. Additionally, the use of a telescope mount allows laser shots at various angles. This presentation covers the ongoing development of the mobile laser system and outlines plans for upcoming measurement campaigns.

**Primary author:** UZEIROSKA, Rukije (Bergische Universität Wuppertal)

**Presenter:** UZEIROSKA, Rukije (Bergische Universität Wuppertal)

**Session Classification:** Main session