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Observation of Spaceborne Lasers with the Pierre Auger Observatory

The detection of side-scattered ultraviolet light from spaceborne lasers with fluorescence telescopes of cosmic ray observatories offers unique opportunities for systematic studies of the aerosol content of the local atmosphere. It also enables the validation of the optical calibration of the telescopes. Additionally, these observations provide valuable ground-based monitoring of the performance of the scientific instruments aboard satellites used for Earth climate observation.

Here, we report on results from the reconstruction of laser shots from the spaceborne lidar instrument ALADIN aboard the Aeolus satellite in 2019, 2020 and 2021. Furthermore, we present initial observations of laser shots from ATLID, the atmospheric lidar of the EarthCARE satellite, launched in 2024. EarthCARE's orbit is particularly well-suited for enabling laser detection within a few days at both the Pierre Auger Observatory and the Telescope Array, facilitating a relative calibration of the energy scales of these observatories.

Collaboration(s)

Pierre Auger Collaboration

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