

# Atmospheric Monitoring for UHECR Space-based Missions

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The JEM-EUSO (Joint Experiment Missions for Extreme Universe Space Observatory) program has the ambition to observe Extensive Air Showers (EAS) induced by Ultra High Energy Cosmic Rays (UHECR) from the Space. For this purpose, the study of the night Earth's atmosphere with respect to the EAS detection is obligatory. A such study needs to address the estimation of the future main instrument performance in various atmospheric conditions as well as the development of the space-based system for direct atmospheric monitoring. The preparation of the methods for the data analysis and their fusion is also a topic that needs to be addressed. The conjuncted operation of LIDAR, Airglow Monitor, Infrared Cloud Camera and Global Light System of ground-based laser stations would provide complex information of the atmospheric conditions from the top of the atmosphere to the ground. The systems for atmospheric monitoring employed in JEM-EUSO pathfinder missions are presented and the consequences of atmospheric changes for the main instrument operation are discussed.

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