Atmospheric Monitoring System of the JEM-EUSO Mission

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Abstract content

JEM-EUSO will study ultra-high-energy cosmic rays by their optical yield in the atmosphere. To evaluate this yield it is important to monitor the atmosphere inside the field-of-view (FOV) of the JEM-EUSO receiver. This monitoring shall permit the correction of the JEM-EUSO signal, where the critical parameters are the cloud presence and top altitude. The Atmospheric Monitoring System will be based on a complex of sensors: infrared (IR) camera, Lidar, and JEM- EUSO "slow-data". The IR camera consists of Ge dioptric lenses, a band-pass filter and an un-cooled micro-bolometer array. It will acquire images of the cloud top temperature covering the JEM-EUSO FOV. The cloud-top altitude will be evaluated from the temperature with relatively low precision. High-precision (30m) Lidar cloud-top altitude measurements will be used to correct the cloud- top altitude from the IR-camera. The Lidar will use laser at 355nm transmitted in three fixed directions, as well as the JEM-EUSO receiver with three dedicated detector. The optical background signal in the UV, detected by JEM-EUSO will allow imaging of the cloud field inside its FOV (the JEM-EUSO "slow-data" operation). The "stereoscope" processing of this image will provide additional low-resolution evaluation of the cloud top altitude.

If this papers is presented for a collaboration, please specify the collaboration

JEM-EUSO

Summary

Reference

Proceedings of the 30th International Cosmic Ray Conference; Rogelio Caballero, Juan Carlos D'Olivo, Gustavo Medina-Tanco, Lukas Nellen, Federico A. Sánchez, José F. Valdés-Galicia (eds.); Universidad Nacional Autónoma de México, Mexico City, Mexico, 2008; Vol. 5 (HE part 2), pages 1053-1056

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