

Atmospheric effects on cosmic ray observations at the Antarctic Peninsula

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Abstract:

At the beginning of 2019, a cosmic ray detector, based on the Cherenkov effect in water, was installed at Marambio base at the Antarctic Peninsula as part of the Antarctic Space Weather Laboratory. This detector is the first permanent Antarctic node of the LAGO (Latin American Giant Observatory) Collaboration. The LAGO project is an extended astroparticle observatory and is mainly oriented to basic research in three branches of astroparticle physics: the Extreme Universe, Space Weather phenomena, and Atmospheric Radiation at ground level. The LAGO Space Weather program is directed towards the study of how the variations of the flux of secondary cosmic rays at ground level is linked to the cosmic rays atmospheric shower and the heliospheric and geomagnetic modulations. Due to the low geomagnetic cut-off of this site low-energy primary particles can reach it, rendering it of particular interest to observe space weather events.

The main purpose of this work is to analyze how the atmospheric conditions affect the count rate observed, which is the primary step in order to get a useful signal for space weather analysis.

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References:

Dasso S., et al., Proc. of the 34th International Cosmic Ray Conference, PoS, 105, 2015. doi: 10.22323/1.236.0105

Gulisano A.M., et al., Boletín de la Asociación Argentina de Astronomía, vol. 62, pp. 280–285, 2021.

Santos N.A., et al., Proc. of the 37th International Cosmic Ray Conference PoS, 395, 2021, doi: 10.22323/1.395.0304.

Santos N.A., et al., Boletín de la Asociación Argentina de Astronomía, vol. 62, pp. 16–18, 2021.

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