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miniTRASGO: A Compact Cosmic Ray Telescope for Global Coverage

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Cosmic rays, discovered in 1912, were initially crucial for uncovering new fundamental particles and have since become key to understanding broader astrophysical phenomena. Today, they provide essential data for multi-messenger astronomy and serve as tools for probing near-Earth space and solar activity. To enhance our understanding of cosmic rays, a new family of modular detectors, called Trasgos, has been developed. These high-granularity tracking devices use Resistive Plate Chambers (RPCs) to detect ionizing secondary cosmic rays and are designed for ease of deployment. The autonomous station presented here, with a detection area of 0.1 m^2, includes built-in sensors for pressure, temperature, and humidity, as well as software for rate monitoring and hit mapping. We discuss the detector's performance and initial innovations, all applied to the observation of a Forbush Decrease. This study highlights the scientific potential of the miniTRASGO concept and its prospective integration into a global telescope network that complements the existing Neutron Monitor Data Base, aiming to advance cosmic ray research worldwide.

Abstract

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