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Akeno Muon Observations: Japan-India Collaborative Research on Near-Earth Space in 2024

Ground based observations of cosmic rays provide one of the most effective methods for investigating the effects of solar activity in near-Earth space. The Akeno muon telescope, which has a similar detection technique configuration and energy threshold for incoming atmospheric muons as the GRAPES-3 muon telescope, serves as one such observation system. The Akeno muon telescope's field of view overlaps by approximately 20 % with that of GRAPES-3 at a distance of 25 Earth radii. By utilizing the multidirectional observation capabilities of both muon telescopes, located in Japan and India, it becomes possible to resolve global cosmic-ray anisotropy and its precise dynamics simultaneously. This type of observation not only advances our understanding of the fundamental mechanisms governing cosmic ray propagation in the interplanetary magnetic field (IMF) but also facilitates the early detection of solar activity-induced phenomena.

In 2024, a large number of solar flares were recorded, and both the Akeno and GRAPES-3 observations successfully captured the resulting variations in cosmic-ray intensity, demonstrating the effectiveness of these instruments in monitoring space weather events.

Collaboration(s)

GRAPES-3

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