

Seminar

Potential Role of GRAPES-3 in Atmospheric Science and Space Weather Forecasting

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GRAPES-3 is a high-altitude, ground-based, cosmic ray observatory located in Ooty, Tamil Nadu, India. It consists of an array of 400 plastic scintillator detectors spread over 25000 m² and a 560 m² muon telescope built using 4000 proportional counters. The GRAPES-3 experiment is in the continuous operation for more than two decades, records about three million extensive air showers in the energy range of TeV — PeV, and about four billion muons above a GeV daily. The GeV muons recorded by the GRAPES-3 muon telescope over 2.3 sr sky are proven to be excellent proxies for the studies of near-earth phenomena such as thunderstorm and solar storm events, and their aftereffects. Due to the disastrous nature of these events, it is not always possible to have the complete understanding with the conventional techniques. GRAPES-3 being a well-situated ground-based observatory which records precise angular muon flux can complement or improve the current understanding on these domains. This talk will discuss two important results on: (i) measurement of 1.3 billion volts in a massive thundercloud [1], and (ii) transient weakening of geomagnetic shield probed by a cosmic ray burst obtained with GRAPES-3 muon telescope [2].

References:

1. B. Hariharan et al., Physical Review Letters 122, 105101 (2019)
2. P.K. Mohanty et al., Physical Review Letters 117, 171101 (2016)

Friday, Aug 23rd 2024

16:00 Hrs (Tea / Coffee 15:45 Hrs)

Seminar Hall, TIFR-H