ICRC2015

ICRC
The Astroparticle Physics Conference
34th International Cosmic Ray Conference
July 30 - August 6, 2015
The Hague, The Netherlands

Contribution ID: **39** Type: **Poster contribution**

A new method for determining atmospheric pressure coefficient by using fast Fourier transform for muons in the GRAPES-3 experiment

Tuesday, August 4, 2015 4:00 PM (1 hour)

A large area (560~m^2) tracking muon detector operating in the GRAPES-3 experiment at Ooty in India has been recording cosmic ray muons at a rate of 1.7×10^8 h^{-1} since 2000. The high statistics data have enabled sensitive measurement of several solar phenomena to be made including the solar and sidereal anisotropy and Forbush decreases following coronal mass ejections. Prior to studies of any of these phenomena, an important task is to correct the variation in measured muon rates due to atmospheric pressure. Unfortunately, the pressure coefficient usually deduced from the observed data is not very reliable due to the presence of various solar phenomena listed above. Here, we present an alternative method which avoids complications arising from solar effects. Since the pressure at Ooty displays a 12 h periodicity, using which we could separate its contribution from other effects in the muon data though a power spectrum analysis using fast Fourier transform technique. The method yielded a clear dependence of muon rate on pressure providing an accurate estimate of the pressure coefficient almost independent of the solar modulation effects.

Collaboration

– not specified –

Registration number following ”ICRC2015-I/”

38

Primary authors: MOHANTY, PRAVATA (Tata Institute of Fundamental Research, Mumbai, India); Prof. SUBRAMANIAN, Prasad ((Indian Institute of Science Education and Research, Sai Trinity Building, Pashan, Pune 411021, India)

Co-authors: Dr OSHIMA, Akitoshi (College of Engineering, Chubu University, Kasugai, Aichi 487-8501, Japan); Mr JAIN, Atul (Tata Institute of Fundamental Research, Mumbai, India); Mr HARIHARAN, B. (Tata Institute of Fundamental Reseach, Mumbai); Mr RAO, B.S. (Tata Institute of Fundamental Research, Mumbai, India); Prof. KOJIMA, H. (Faculty of Engineering, Aichi Institute of Technology, Toyota City, Japan); Prof. ANTIA, H.M. (Tata Institute of Fundamental Reseach, Mumbai); Prof. TANAKA, K. (Faculty of Information Sciences, Hiroshima City University, Hiroshima 731-3194, Japan); Dr ARUNBABU, K.P. (Tata Institute of Fundamental Research, Mumbai, India); Mr JAGADEESAN, P. (Tata Institute of Fundamental Research, Mumbai, India); Dr NAYAK, P.K. (Tata Institute of

Fundamental Research, Mumbai, India); Prof. KAWAKAMI, Saburo (Gratuate School of Sciences, Osaka City University, Osaka, Japan); Mr MORRIS, Samuel (Tata Institute of Fundamental Research, Mumbai, India); DUGAD, Shashi (Tata Inst. of Fundamental Research (IN)); Prof. SHIBATA, Shoichi (College of Engineering, Chubu University, Kasugai, Aichi 487-8501, Japan); Prof. GUPTA, Sunil (Tata Institute of Fundamental Reseach, Mumbai, India); Dr NONAKA, T. (ICRR, Tokyo, Japan); Prof. HAYASHI, Yoshio (Graduate School of Sciences, Osaka City University, Osaka, Japan)

Presenter: MOHANTY, PRAVATA (Tata Institute of Fundamental Research, Mumbai, India)

Session Classification: Poster 3 SH

Track Classification: SH-EX