

Long-term variation of galactic cosmic ray intensity observed with the Nagoya multidirectional muon detector

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We have recently developed a correction method of the atmospheric temperature effect on muon count rate by using the GMDN (Global Muon Detector Network) data (R. R. S. Mendonca et al., *Astrophys. J.*, 830:88, 2016). This is a significant step, because it makes possible for the first time to analyze the long-term variation of ~ 50 GeV cosmic ray density (i.e. isotropic intensity) which has been analyzed only for cosmic ray below ~ 10 GeV using the neutron monitor data nearly free from the temperature effect. In this paper, we report the 11-year and 22-year variations of cosmic ray density observed with Nagoya muon detector in 1970-2016 and discuss the energy dependence of variations by comparing the observation with neutron monitors.

Keywords: long-term variation of galactic cosmic ray intensity, energy spectrum of galactic cosmic rays, solar modulation