



Power Spectrum of Cosmic Rays Intensity

I. Sabbah (1), D. Khalil (2) and (3) A. Zaher

Department of Physics, Faculty of Science, Kuwait Univeristy

Power spectra of cosmic rays intensity have been calculated from the daily averaged counts observed by neutron monitors (NMs) at Climax, and Huancayo/Haleakala (HU/Ha) and muon surface telescope (MST) at Nagoya over the frequency range $1.2 \times 10^{-4} \text{c/day} - 5 \times 10^{-1} \text{c/day}$. The detectors cover the median primary rigidity range 18 GeV – 60 GeV. The spectra have been calculated for the period (1951-2006) showing periodicities at 22, 11.2, 5.6, 3, 1.7, 1 year and 217, 155, 113, 109, 84, 72, 37.4, 29.4, 27-27.9, 13.7, 10.8, 9.7, 9, 8.6, 7, 6.7, 5.2, 4, 3.8, 2 days. The magnitude of the spectra is rigidity dependent. The largest magnitude occurs during cycle 22. The spectrum is expressed by a single power law dependence of the form f^{-n} , where n is rigidity dependent for $f \leq 10^{-2} \text{c/day}$. The value of n is larger in for the even cycles than the odd cycles. A clear break is noticed for HU/Ha NM at cycle 19 causing a plateau in the frequency range: $8 \times 10^{-3} - 6 \times 10^{-2} \text{c/day}$. The magnitude of the 27 and 13.5 days observed with NMs are higher for positive solar polarity ($qA > 0$) epochs than for the negative solar polarity ($qA < 0$)