Geophysical Research Abstracts,
Vol. 10, EGU2008-A-01102, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-01102
EGU General Assembly 2008

A study of cosmic ray on high latitude NM

K. A. Firoz

Department of Nuclear and Sub-nuclear Physics, Institute of Physics,

University of Pavol Jozef Safarik (UPJS), Jesenna 5, Kosice, Slovakia

Email: kazifiroz2002@gmail.com

A correlation study is performed over a high latitude neutron monitor and the corresponding solar activity parameters. Results discussed in the paper are hinted as follows.

Cosmic ray intensity is inversely related to the IMF (B_{tot}) when sunspot numbers are directly to the IMF (B_{tot}) most of the time without few exceptional events. The amplitude and dispersion of cosmic ray intensity is directly proportional to IMF (B_{tot}) and negatively with IMF (Bz). Cosmic ray intensity is generally disposed by the IMF (B_{tot}) and by its three components as well. To an extent, IMF components are always more or less inversely proportional to the local time (LT). Indeed, total magnetic field of IMF components is better anti-correlated with the local time. The highest cosmic ray intensity (at UT 16:00 hour on 29^{th} of October 1989) is nearly twice the lowest cosmic ray intensity (13^{th} of June 1991). The highest cosmic ray intensity coincides with ground level enhancements (GLE) but the lowest intensity does not with Forbush decrease event. Two Forbush decreases (FDs) are marked within the year 1964 – 2007. Of them, first highest FD was occurred at UT 18:87 (Hr) on 14^{th} of July 1982 when normal IMF southward polarity was active with sunspots in extreme. The second highest FD was occurred at UT 12:38 (Hr) on 5^{th} of August 1972 when intense IMF north polarity was found active with sunspots in even less than during the time of GLE. The first highest FD has the amplitude and dispersion with close pulsation but the second highest FD has dispersion nearly three times the amplitude. The difference in intensities between them was nearly 12% but the difference of sunspots was more

than 90% (approximately). The correlation of amplitude and dispersion with IMF and data investigation imply that high IMF magnitude is associated with higher amplitudes as well as dispersions in most of the cases. Over five hundred highest and lowest cosmic ray intensities along with their corresponding solar parameters correlation effects are further investigated. Though the highest intensity bears the highest amplitude, the lowest intensity does not the lowest amplitude. With exceptions counted, the frequency of Northward IMF is more on the highest cosmic ray intensity and less on the lowest cosmic ray intensity. Highest and lowest cosmic ray intensity has solar wind proton temperature inversely correlated while directly correlated if accompanied by IMF (Bz). Solar wind proton density is inversely related during the highest cosmic ray intensity while positively during lowest cosmic ray intensity but they are throughout positively correlated when accompanied by IMF (Bz). With both highest and lowest cosmic ray intensities IMF (B_{tot}) are negatively related whereas the case is opposite in terms of IMF (Bz).