STATISTICAL ANALYSIS OF THE GROUND LEVEL ENHANCEMENTS REGISTERED IN DIFFERENT SECONDARY FLUXES AND AT DIFFERENT ALTITUDES

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Similar to the physics of the galactic cosmic rays, the most important and interesting issue concern solar cosmic rays is the detection of the particles of highest energies and estimation of the energy of the "spectral knee" (turnover, or e-folding). The knee energy of the majority of the large solar events exceeds the detection thresholds of space-born detectors and only the joint observation with satellite and surface monitors can provide information to estimate the knee energy and spectral indices.
Unfortunately, ground based detectors cannot identify directly the type of the primary particles responsible for the peaks in the count rates, therefore, we propose in companion paper (Martirosyan et al., this conference) to investigate the fine structure of Ground Level Enhancements (GLE) and using information from space-born spectrometers identify different ions giving rise to count rates in monitors of Aragats Space Environmental Center (ASEC).
In this concern it became of major importance to develop statistical procedures for the estimation of the detected GLE significance for the event selection procedures operating with the data bases from several ASEC installations.
Developed techniques were applied to the data piece from the half-year operation of Aragats Neutron Monitors (data is available on-line from http:// crdlx5. yerphi.am).
As the basis of our analysis we take the 1 minute count rates of the Neutron Monitor. As a basic parameter for the estimated GLE we use the variation factor (number of s -as):
$Ns = (RATE_{in\ peak} - MEAN)/S$.
Other parameters are the relative variation: $(RATE_{in\ peak}-MEAN)/MEAN$,
and relative spread : S/MEAN,
where S is the measure of the spread and MEAN is the measure of the centrality.
We use both parametric (arithmetic mean and root square deviation) and nonparametric (median and interquartile range) measures of centrality and spread. Also we use different time-spans (from 1 to 2 hours) for calculating the moving average of the count rate and relative spread, all giving estimated values very close to each other.
The events candidates were selected in associated with time of the start of X-ray flare. 25 minute spans before and after the flare start were scanned for possible coincidences of peaks in count rates of both monitors. The coincidence rates expected from the random fluctuations were examined with two special developed randomized tests mimicking the selection procedure.

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