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Association of solar flux (2800 MHz) & cosmic ray intensity for solar cycle 22 and 23

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Abstract
The variation of galactic cosmic rays in the heliosphere in correlation with the solar activity presents a high scientific interest for several aspects. The possibility of studying the energy charge (& mass), spatial & temporal distribution of cosmic rays in the interstellar space, in the vicinity of the solar system, can provide a better understanding of astrophysical mechanism like, for instance, the acceleration of charged particles in a shocked plasma. Galactic cosmic rays in turn can be used as a unique tool for deeply understanding the characteristics & the dynamics of the heliosphere. So it is necessary & significant to investigate the role of various solar parameters in the variation of galactic cosmic rays. Solar radio flux is the energy emitted by the sun with a slowly varying intensity. The amount of this energy is high in the corona & it changes gradually day to day in response to the numbers of spot groups on the solar disk.

Keywords: cosmic ray intensity (CRI), solar flares, solar flux (2800MHz)

Introduction
It is now significant to see the effect of this parameter (Solar flux) in the long-term variation of cosmic rays for different solar cycle 22, 23 & ascending phase of recent solar cycle 24. For this analysis we have used monthly mean values of solar flux (2800 MHz) & monthly mean counts of Kiel, Moscow & Huancayo neutron monitors stations (Mishra 2001. Singh 2006) [1, 2].

Here we used solar flux (2800 MHz) to derive the running cross-correlation function between cosmic ray intensity of neutron monitor Kiel (R = 2.36 GV), Moscow (R = 2.39 GV) & Huancayo (R = 13 GV) & solar flux (2800 MHz).

Methods
In this analysis we have taken the monthly mean value of solar flux from the solar geophysical data compressive report (1998) & determine cross-correlation between solar flux & cosmic rays intensity (CRI) neutron monitors Kiel, Moscow & Huncayo.

Results & Discussion
In the present analysis we have calculated running cross-correlation

Function between solar flux & cosmic ray intensity neutron monitor count rates. To see the effect of energy on running cross-correlation function we have selected the neutron monitor station Kiel, Moscow & Huncayo. Fig 1.1, fig 1.2 & fig 1.3 shows the cross-plot between solar flux (2800 MHz) & cosmic ray neutron monitor stations Kiel, Moscow & Huancayo for solar cycles 22 & 23. It is seen from the figure odd solar cycle shows similar loop structure & also even solar cycle shows similar loop structure but small in comparison to odd solar cycle. Therefore it might be said that there is a strong even-odd asymmetry in the variation of galactic cosmic rays by the solar flux (2800 MHz) for the different energy cosmic ray particles.

Conclusions
In given analysis we have find that the behavior of all cross-

correlation curves coincides fairly well with each other.

Acknowledgements
The author thanks the world data centre- A solar terrestrial physics, & solar geophysical data compressive report (1998), for providing data.

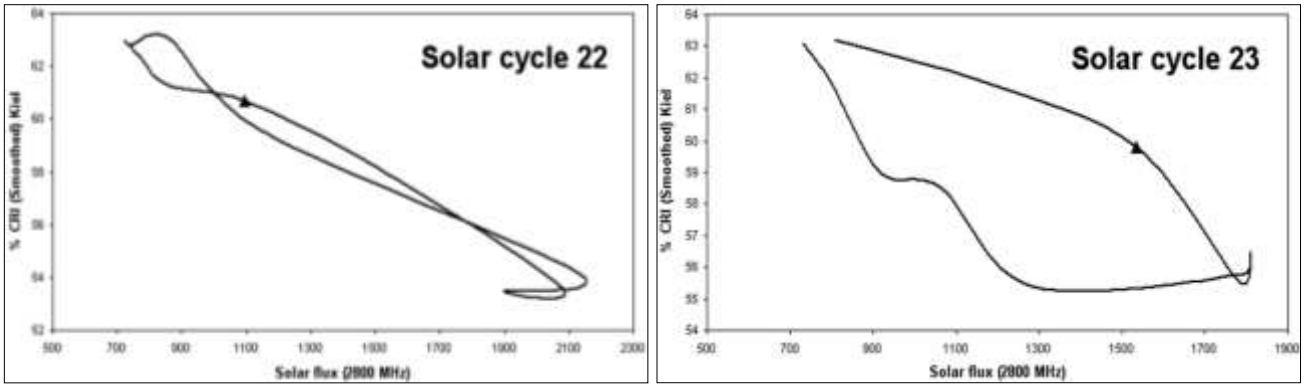

Fig 1: Cross correlation between Solar flux (2800 MHz) & counts of Kiel neutron monitor of the solar cycle 22 & 23.

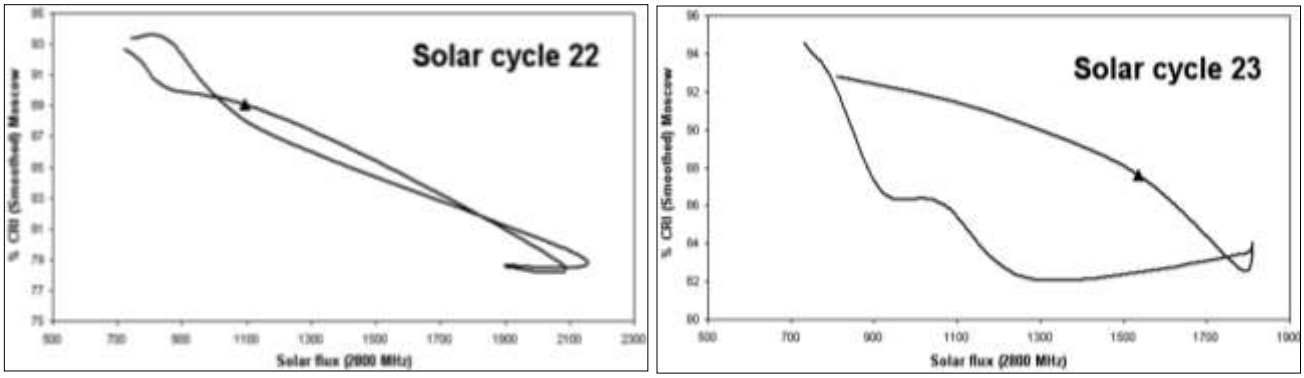

Fig 2: Cross correlation between Solar flux (2800 MHz) & counts of Moscow neutron monitor of the solar cycle 22 & 23.

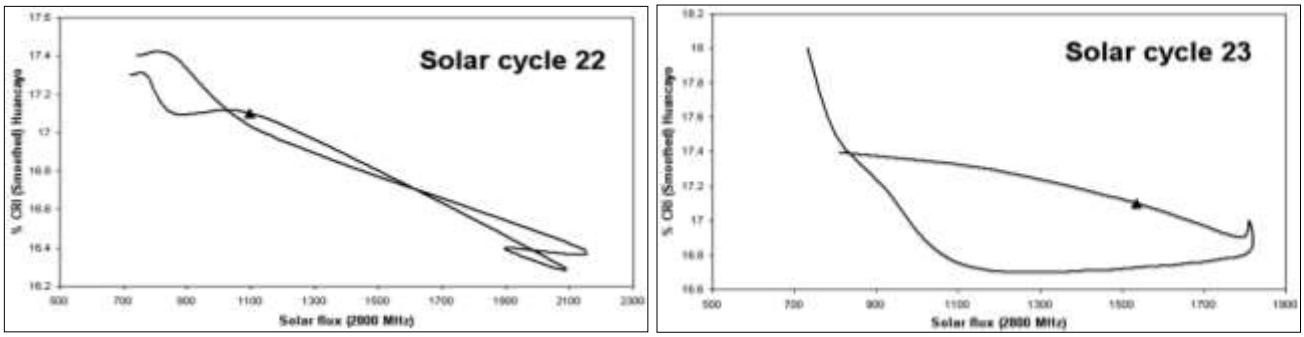

Fig 3: Cross correlation between Solar flux (2800 MHz) & counts of Huancayo neutron monitor of the solar cycle 22 & 23.

References

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