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TRANSIENT PHENOMENA IN COSMIC RAY INTENSITY DURING EXTREME EVENTS

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In the present work analogous analysis has been made for the extreme events occurred during July 2005. Specifically, rather intense Forbush decrease was observed at different neutron monitors all over the world during 16 July 2005. It started some hours before arrival of a weak shock associated with a CME from 14 July 2005. It is rather a peculiar event, as it is not a ground level enhancement of solar cosmic rays and not a geomagnetic effect in cosmic rays. An effort has been made to study the effect of this unusual event on cosmic ray intensity as well as various solar and interplanetary plasma parameters. It is noteworthy that during 11 to 18 July 2005, the solar activity ranged from
low to vary active. Especially low levels occurred at the 11, 15 and 17 July whereas high levels took place on the 14 and 16 July 2005. A series of Forbush effects took place from 12 July causing a decrease in cosmic ray intensity of about 2%, by the 16 th July 2005. An intensive Forbush decrease of cosmic ray intensity observed on 16 th July 2005. The characteristics of this Forbush decrease on 16 th July, 2005 indicate that it does not comprise ground level enhancement of solar cosmic rays neither a geomagnetic effect in cosmic rays. The Sun is observed active during 11 to 18 July 2005 and the interplanetary magnetic field intensity lies within 15 nT and solar wind velocity was limited to ~ 500 kms -1 . The geomagnetic activity during this period remains very quite, Kp index did not exceed 5, the disturbance storm time Dst index remains ~ - 70 and no sudden storm commencement (SSC) has been detected during this period. It is noted that for majority of the hours, the north south component of IMF, Bz remains negative and cosmic ray intensity increases and shows good/high correlation with Bz and as the polarity of Bz tends to shift from negative to positive values, the intensity decreases and shows good/high anti-correlation with Bz. The cosmic ray intensity tends to decrease with the increase of IMF strength (B) and shows anti-correlation for majority of the days.

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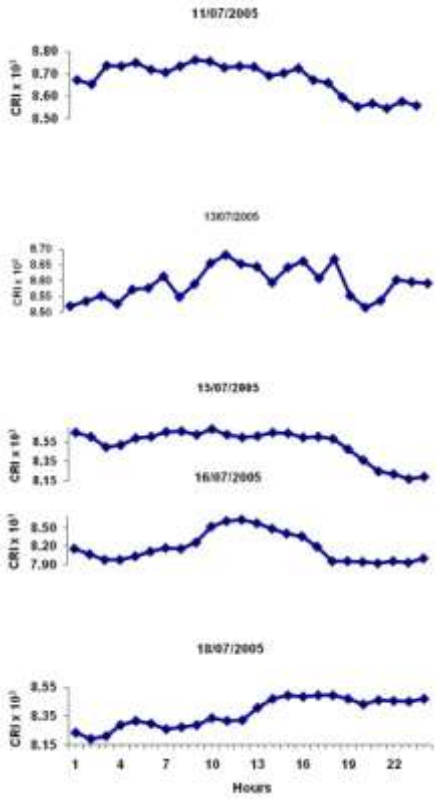

Fig 1: Cosmic ray intensity variation during July 11 – 18 2005.

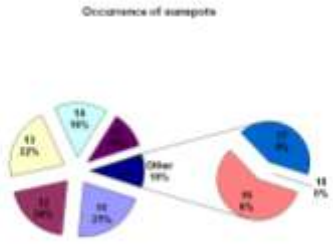

Fig 2: Frequency of occurrence of sunspot numbers during July 11 – 18 2005.
Figure xx

Note: Abstract should be in (full) double-columned one page.