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Modulation of Cosmic Ray Intensity along with Interplanetary Causes and Solar Activity Parameters during Solar Cycle 24

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Abstract: ***Modulated of cosmic rays and their propagation in the heliosphere by the effect of the large-scale structure of the interplanetary medium. Its comparison of the variations of cosmic Neutron monitor intensity with variation of sunspot number, geomagnetic indices, solar wind velocity (V), interplanetary magnetic field (B), near the Earth for the period solar cycle 24 .it has been accessible as a likely correlation among them. we calculated the yearly average cosmic ray counts detected with Oulu NM. It is significantly undesirable correlation have been detected between interplanetary magnetic field (B), and cosmic ray intensity earlier the solar cycle 24. The sunspot number and solar wind velocity has a noble positive relationship with cosmic ray intensity during solar cycle 21, but it indications weak association before through solar cycle 24. The interplanetary magnetic field, B displays a weak negative association with cosmic rays for the solar cycle, while B shows a noble anti-correlation for the before during solar cycle 24 through cosmic ray intensity. The cosmic ray intensity displays decent positive correlation through interplanetary causes time, and geomagnetic indices (Dst) index forgoing the solar cycle 24 , whereas shows weak correlation for formerly the cycle 24.***

Keywords: Sunspot number, Geomagnetic indices, Solar Wind, Interplanetary Magnetic Field.

1. Introduction

Study of the modulation Galactic cosmic rays above ~3 GeV are thought to be for many decades on the online worldwide network NM, which measures nucleonic flows in Earth's atmosphere and provides one long-term extents High-energy cosmic rays. Cosmic rays are being regularly monitored by Ground-based neutron tracing has been carried out aton Earth for the past several decades. Observations so far indicate a clear solar cycle impact, with the largest decrease in cosmic ray NM intensity during sunspot maximum Years [1-2].Galactic cosmic ray intensity slow Earth is associated to the cycle action of the Sun, which is fine acknowledged. Solar magnetic field every once solar cycle, the number of sunspots (SSN) and the 'coronal mass ejection'(CMEs) growths and cascades twice in each solar cycle CRI The concentration on Earth also crests twice every solar cycle. Now this time with the solar cycle observation a twist in form and they trust a coronal mass ejection (CMEs) may occur fault. CRI vary in intensity time scale, since records to periods and even Onward. These variants can be casual using Data from worldwide network NM. [4] Originate from major solar cycle variation in the magnitude of CRI fluctuations for 2008-2019 using minutes. Data from oulu neutron monitor (NM). There was also a solar cycle variation is initiate in the band of minor scale disorder [5]. Solar cycle variation in CRI deviations in solar cycles 24 using data since two reserved polar NM, Oulu and thule [6]. Now the Modulation of Galactic Cosmic Rays significant as a its ability to reveal refined structures of energetic charged particles transport in complex areas that allows as a distant part to investigate the heliosphere, as well as to learn about the astronomy of ongoing progressions Sun.

The periodic solar cycle on galactic cosmic ray modulation is has been considered relatively peacefully since the exertion of Forbush [1]. We observed an anti-correlation among the intensity of cosmic rays and sunspots Number. Now see the sunspots are Strong magnetic field places on the Sun's photosphere. Furthermore, an instance has been ready that limited value of the interplanetary magnetic field shows an important part in cosmic rays modulation at an observation site [7-10]. In 22 year cycle Cosmic-Ray (CR) modulation Cycle. Cosmic ray time profiles are severe peak nearby solar minimum when is positive in the interplanetary magnetic field (negative) polarity in the hemisphere. Cosmic-ray intensity increase rapidly on the time scale of 1-2 years hence quite initial in the cycle, CR intensity and the related radiation reaches an extreme level.

Data source and Analysis

Now we taken data of temperature and pressure corrected hourly data (counts of neutrons) of cosmic ray intensity from Oulu neutron monitor and Omni-web data Centre, wherever the long-term variation from the data has unconcerned by the process of inclination alteration. The days of cosmic ray decreases have also distant from the investigation to escape their impact in cosmic ray variation (CRI). Interplanetary magnetic field (IMF) and solar wind plasma (Sw) data have been taken from the interplanetary medium data from website.

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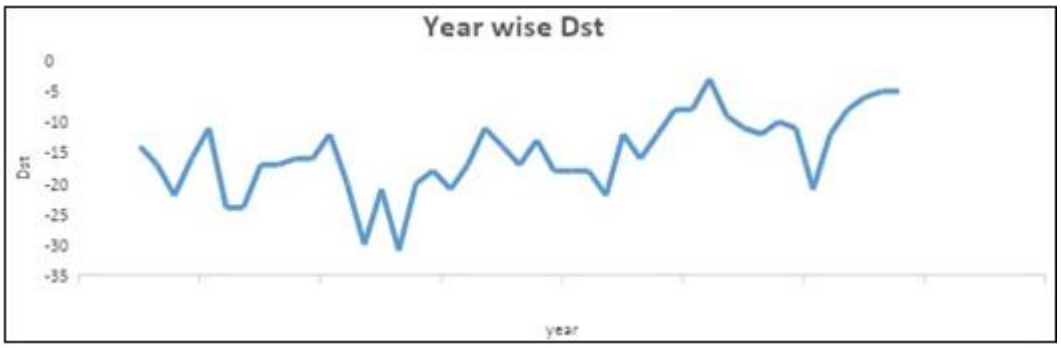

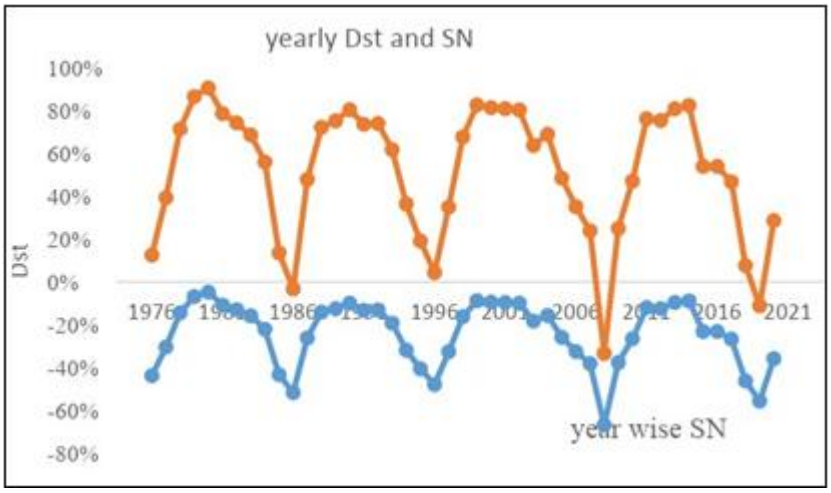

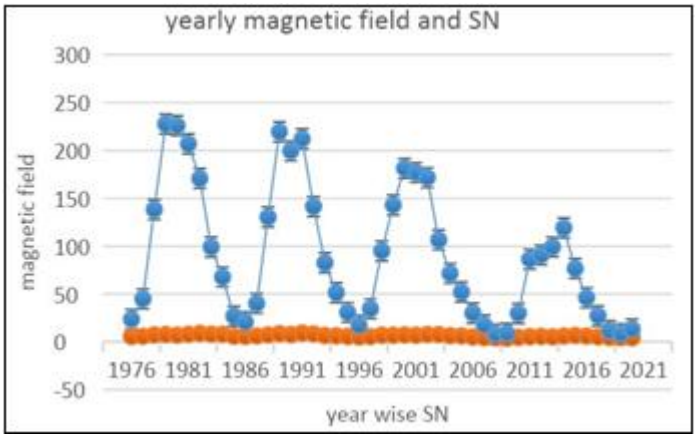

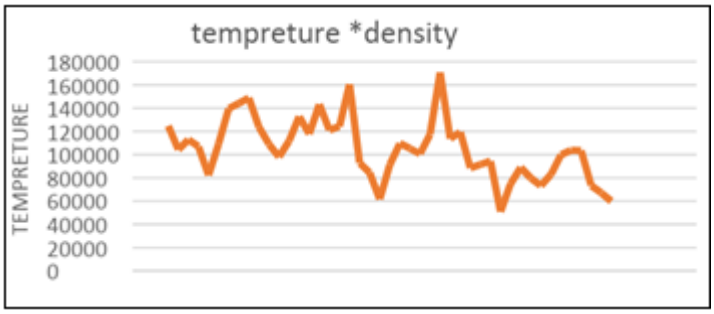

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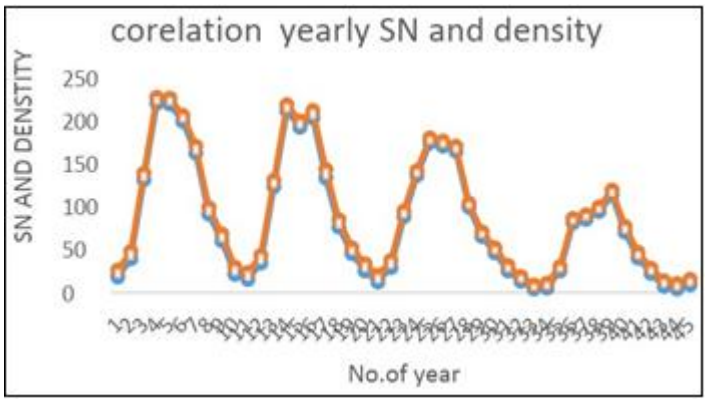

2. Results and Conclusion

The indications and plots of cosmic ray intensity (NM count rates for Oulu neutron monitor and OMNI web data , interplanetary magnetic field (B), disruption storm time index (Dst), solar : Yearly variant of cosmic rays along with interplanetary magnetic field (B), disruption storm time index (Dst), solar wind velocity and the magnetic field (B prior during solar cycle and 24 cycle. Solar wind velocity (Sw), the magnetic field and cosmic ray intensity standardized in a appropriate mode they are signify the constant sequential variations of cosmic rays beside through altered factors ended the last few decades to present. So that our studies following conclusions may be drawn:

- A important negative association have been saw between interplanetary magnetic field, and cosmic ray intensity formerly in the solar cycle 24.
- The solar wind velocity has a decent encouraging association with cosmic ray intensity in solar cycle 21, but it displays feeble relationship in earlier cycle as well as 24.
- The interplanetary magnetic field, B displays a feeble destructive relationship with cosmic rays for the solar cycle 20, but B displays a decent anti-correlation for the solar cycles 21- 23 with cosmic ray intensity.
- The cosmic ray intensity displays decent positive relationship with disruption time index (Dst) index during the solar cycle 21 and 22, whereas shows weak correlation for the earlier cycle and 24.

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References

[1] S. E. Forbush, J. Geophys. Res., 59, 525,1954.
[2] H. S. Ahluwalia, and M. D. Wilson, J. Geo phys. Res., 101, 4879, 1996.
[3] E. W. Cliver, and A. G. Ling, Astrophys. J. Lett., 551, L189, 2001.
[4] E. G. Berezhko, I. A. Brevnova, and S. A. Starodubtsev, Astronomy Letters, 19, 4, 304, 1993
[5] S. A. Starodubtsev, Astronomy Letters, 25, 8, 540, and 1999.
[6] S. A. Starodubtsev, and I. G. Usoskin, Astronomy Letters, 29, 594, 2003
[7] H. S. Ahluwalia, Geophys. Res. Lett., 27, 1602, 2000.
[8] S. TIWARI and R. K. MISHRA, et al. ICRC 2007 Proceedings - Pre-Conference Edition, 2007.

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