March 2024 has been a less active month than February 2024 in terms of solar activity. A number of 144 coronal mass ejections (CMEs) has been spotted, 10 CMEs with angular width 90° < da < 180°, two CME with angular width 180° < da < 270° and two HALO CMEs recorded in this month, resulting into distinct modulation of the galactic cosmic rays (GCRs) (source: http://sidc.oma.be/cactus/catalog.php). March was a more productive month in the sense of solar flares (SFs). A number of 50 M-class and 2 X-class solar flares were spotted this month (https://solarmonitor.org), the most energetic one being a X1.1 flare on March 23 at 01:33 UT (peak time) from the AR3614. Also GOES Proton Flux for particles with energies above 10 MeV exceed the SWPC 10 MeV warning threshold for solar radiation storm of level S2 two times during this month, on March 15 and 23.

March was a more active month in the sense of geomagnetic activity in contrary to previous months. The interaction of CME effects combined with high-speed solar wind streams from coronal holes caused geomagnetic storms on March 03, 21, 23 and 24. It is remarkable that the geomagnetic storm on March 24 reached the level G4 (Figure 1). This storm was noticed due to the effect of the CME observed on the Sun on March 23 and was associated with an X1.1 class solar flare peaking on March 23 at 01:33 UT.

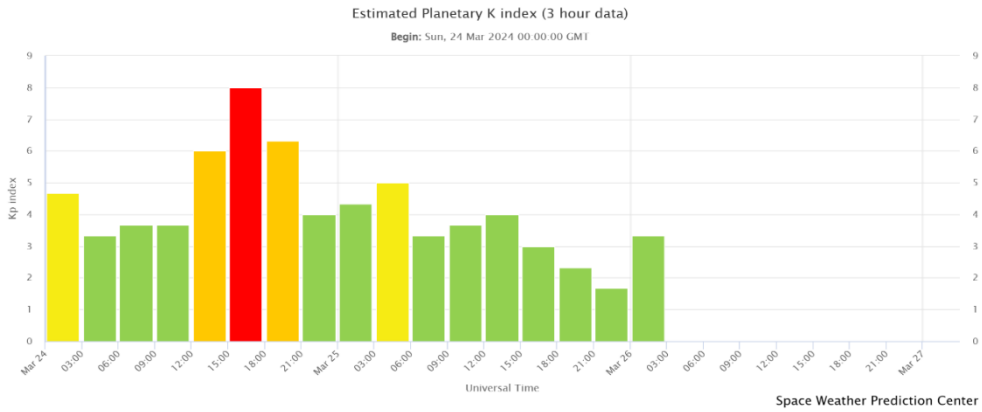

Figure 1: Kp index values for the period March 24-25, 2024.
http://www.swpc.noaa.gov/products/planetary-k-index

The results of these events during this month were spotted on the cosmic ray intensity, recorded at Athens Neutron Monitor Station (cut-off rigidity 8.53 GV) (Figure 2). Also, an important Forbush decrease was recorded by the neutron monitors. This Forbush decrease with extremely rapid recovery started on March 24 as a result of the above geomagnetic storm with level G4.

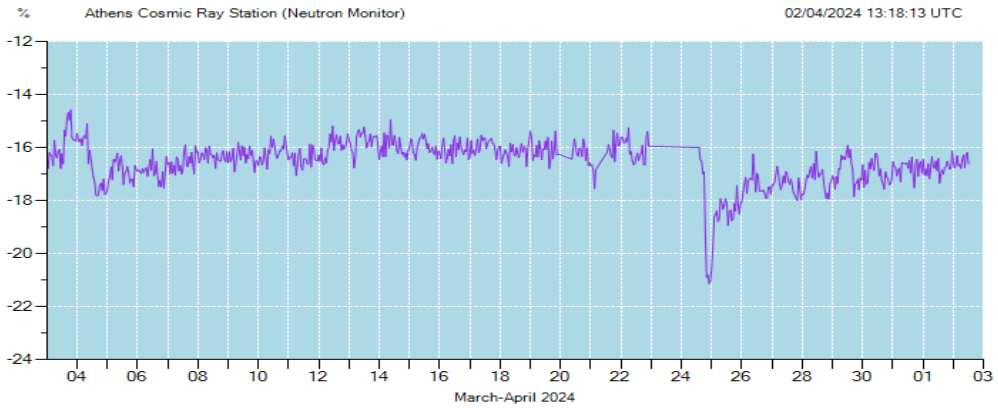

Figure 2: The counting rate of the Athens Neutron Monitor Station during March 2024. (Home (uoa.gr))

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