

Space Weather Forecast

Issued on Friday, 03 December 2021 at 13:16 Local

This forecast provides a four day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales <https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales>

Space Weather Forecast Headline: Chance of G1/Minor Storm activity mainly day 1 (3rd) or early day 2 (4th)

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was very low, with no significant flares detected. There are currently four sunspot regions visible, however all regions are currently small and weak, with two soon to rotate off the Earth-facing disc. A filament, which is a line of plasma material held above the Sun's surface by its magnetic field, lifted off from the surface on the morning of the 3rd. This has the potential to produce a coronal mass ejection (CME), however no imagery is currently available to assess this risk. No other Earth-directed CMEs are in the forecast.

Solar Wind / Geomagnetic Activity: The solar winds remained slightly elevated, with only a weak magnetic field, but did show signs of a weak CME glancing across Earth, including a slightly faster shock region during the afternoon of the 2nd, and then a smooth rotation in the magnetic field of the wind overnight. This was likely the passing of a CME which left the Sun on the 29th, but was very weak. A transition has now occurred, since 03/0900 UTC to a region of solar wind with slightly stronger, but still weak, magnetic field, but generally pointing southward in the important north-south direction. This is likely boundary region before Earth moves into the faster solar winds from a coronal hole. Despite the weak CME arrival, geomagnetic activity remained Quiet to Unsettled overnight (Kp 1-3)

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background with no solar radiation storms observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is likely to remain mostly very low, with a slight chance of common class flares.

Solar Wind / Geomagnetic Activity: No Earth-directed CMEs have been observed, however the filament lift from the northwest on the morning of the 3rd has the potential to produce one, and will be assessed once imagery is available. Faster solar winds from a coronal hole are expected to soon arrive day 1 (3rd), with solar winds likely becoming elevated. Ongoing fast wind influence is then expected day 2 (4th) and day 3 (5th), with coronal hole 28, before easing later in the period. Quiet geomagnetic activity at first is forecast to become Unsettled to Active with isolated G1/Minor storm intervals likely either later day 1 (3rd) or early day 2 (4th). Quiet to unsettled activity expected to return by day 4 (6th).

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to persist at background with no solar radiation storms expected.

Geomagnetic Storms:

Geo-Magnetic Storm	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Minor or Moderate	G1 to G2	No	40	30	10	1
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X Ray Flares:

X Ray Flares	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability			(%)	(%)	(%)	(%)
Active	R1-R2 M Class	No	1	1	1	1
Very Active	R3 to R5 X	No	1	1	1	1

Solar Radiation Storms - (High Energy Protons):

Radiation Storms	Level (cm ⁻² sr ⁻¹ s ⁻¹)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC)	Day 2 (00-24 UTC)	Day 3 (00-24 UTC)	Day 4 (00-24 UTC)
Probability (Exceedance)			(%)	(%)	(%)	(%)
Active	≥ S1	No	1	1	1	1
Very Active	≥ S3 *	No	1	1	1	1

* S3 ≥ 10 MeV ≥ 1000 pfu and / or ≥ 50 MeV ≥ 10 pfu. (pfu = cm⁻²sr⁻¹s⁻¹)