
Space Weather Forecast

Issued on Friday, 24 December 2021 at 01:23 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 Minor geomagnetic Storm early today with CME arrival. Chance of Moderate flares, with slight chance strong flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity has been Low over the past 24 hours, with numerous Common-class flares observed. There are nine sunspot regions, with AR2907 the most magnetically complex and most likely to produce significant flares. The other regions potentially capable of producing significant flares are; AR2916, which remains a large, stable region, along with regions AR2917 and AR2918 in the eastern hemisphere. All other regions are small and magnetically simple.

No Earth-directed CMEs were observed in available imagery in the last 24 hours, although three are potentially on route, although confidence is very low in the latter two with only glancing impacts possible.

Solar Wind / Geomagnetic Activity: Solar winds have been elevated but gradually easing throughout the past 24 hours. The total magnetic field has been weak with the important north-south component also varying weakly. Geomagnetic activity has been Quiet.

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

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity with further common flares, a chance (40%) of Moderate flares and a slight chance (10%) of Strong flares.

Solar Wind / Geomagnetic Activity: There are three potentially Earth-directed CMEs. The first from the 20th, expected to arrive early today (24th). The other two CME's are from the 21st and 22nd. These are both very weak, and with low confidence, probably missing just ahead of Earth but could glance Earth on the 26th or 27th. Outside of potential CME influence the currently elevated solar winds are likely to continue to gradually ease, as the effects of a previous coronal hole decline, until day 4 (27th) when a further enhancement of the solar wind is expected to arrive. Quiet to Unsettled geomagnetic activity is generally expected with Active intervals, and a chance of Minor Storm today and a slight chance on day 4.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) is forecast to stay at background with no solar radiation storms expected. Any significant flares could lead to this count rate increasing, but are still expected to stay below radiation storm level.

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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	30	5	5	10
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	40	40	40	40
Very Active	R3 to R5 X	No	10	10	10	10

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	5	5	5	5
Very Active	≥ S3 *	No	1	1	1	1

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