

Space Weather Forecast

Issued on Wednesday, 08 December 2021 at 00:28 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: Slight chance of G1/Minor Storms on Days 2 and 3 (09 and 10 Dec).

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Very Low over the past 24 hours. There is currently only one sunspot region on the visible disc, which is a small and simple region in the southeast quadrant, and has faded a little recently. No Earth-directed CMEs (coronal mass ejections) have been observed in the past 24 hours.

Solar Wind / Geomagnetic Activity: The solar wind speed was at mainly elevated levels varying around 500km/s for much of the period. It showed a gradual decline from 07/1400 UTC and is now around 420 km/s. The Interplanetary Magnetic Field was weak and the north-south component also varied weakly. The resultant geomagnetic activity was Quiet to Unsettled (Kp 0-3). These parameters suggest an ongoing connection to a fast wind from two coronal holes which are no longer visible on the disc.

Energetic Particles / Solar Radiation: No solar radiation storms were observed.

Four-Day Space Weather Forecast Summary

Solar Activity: Solar activity is expected to be mainly Very Low, with just a Slight Chance of Common-class flares from the one small and simple sunspot region on the disc.

Solar Wind / Geomagnetic Activity: There are now two potentially Earth-directed CMEs in the forecast, with an earlier CME now considered to have missed Earth. The first CME is expected to arrive on Day 2 (09 Dec) at 1800UTC +/-9 hours, but confidence is low due to limited imagery for analysis. The second CME will likely arrive at Earth as a weak feature on Day 3 (10 Dec) around 0900 UTC +/-12hrs.

The current slightly elevated wind speeds from a coronal hole are expected to ease to background levels within the next 24 hours. A further fast wind enhancement is possible during Day 2. Overall, there is a 20% Chance of G1/Minor Storms on Days 2 and 3 should the CMEs arrive, perhaps coinciding with the arrival the fast wind. Geomagnetic activity is expected to be mostly Quiet to Unsettled in the absence of any CME influence.

Energetic Particles / Solar Radiation: No solar radiation storms are 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	1	20	20	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)