

## Space Weather Forecast

Issued on Tuesday, 07 December 2021 at 12:49 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>

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**Space Weather Forecast Headline: Slight chance of G1/Minor Storms on the 9th and 10th.**

### 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, AR2904, which is a small, simple and stable Beta/Bxo, situated in the southeast quadrant. No Earth-directed CMEs (coronal mass ejections) have been observed in the past 24 hours.

**Solar Wind / Geomagnetic Activity:** The solar wind, as measured by DSCOVR at L1, varied between slightly elevated to elevated, between 460km/s and 520km/s, due to an ongoing connection to a fast wind of a coronal hole. The total interplanetary magnetic field strength was weak, with the all important north/south component also weak. Resultant geomagnetic activity was generally Quiet to Unsettled (Kp 1-3).

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

### Four-Day Space Weather Forecast Summary

**Solar Activity:** Solar activity is expected to be Low or Very Low, with the chance of further notable flares from around the limb now significantly decreased, leaving one current front-sided sunspot.

**Solar Wind / Geomagnetic Activity:** There are three potentially Earth-directed coronal mass ejections (CMEs) in the forecast.

The first CME in the forecast is from a filament eruption on Friday 03 December, scheduled as a near-miss of Earth on Tuesday 07 December. A placeholder 5% risk of G1 is included as a result.

The second coronal mass ejection is a faint emission from a filament eruption on Sunday 05 December, and is expected to arrive Thursday 09 December 1800UTC +/-9 hours, but again confidence is low due to limited imagery for analysis.

The third CME which left the Sun as a filament lift-off late on 05 December will likely arrive at Earth as a weak feature on Friday 10th December around 0900 UTC +/-12hrs.

The current elevated wind speeds are expected to ease during day 1 (Tuesday 07 December), before a further fast wind enhancement is possible towards the end of day 3 (Thursday 09 December). All considered, there is a Very Slight Chance of G1/Minor Storm on day 1 from the probable near miss from the 03 December coronal mass ejection, with 20% Chance of G1/Minor Storms on Thursday 09 and Friday 10 December should the CMEs arrive, perhaps coinciding with the arrival of the next coronal hole fast wind.

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**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	5	1	20	20
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 <sup>-2</sup> sr <sup>-1</sup> s <sup>-1</sup> )	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<sup>-2</sup>sr<sup>-1</sup>s<sup>-1</sup>)