

Space Weather Forecast

Issued on Thursday, 30 December 2021 at 00:49 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>

Space Weather Forecast Headline: Slight chance of Minor Geomagnetic storm, mainly on Day 3.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity is Low with a number of Common-class flares. Five active regions cover the visible disc. The most complex region in the southwest produced the most significant flare at 29/0428 UTC. The other regions are weak and relatively stable with a decline in activity observed. No Earth-directed Coronal Mass Ejections (CMEs) were observed.

Solar Wind / Geomagnetic Activity: Solar winds were Slow to slightly elevated. The important north-south component was weak for much of the period with Moderate activity noted from 29/1900 UTC. Geomagnetic activity was Quiet (Kp 1-2).

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

Four-Day Space Weather Forecast Summary

Solar Activity: Low solar activity is likely through the coming four-day forecast period. No significant regions are anticipated to rotate onto the visible disc from the far-side in the period.

Solar Wind / Geomagnetic Activity: Earth may experience a glancing blow from a CME on Day 1 (30 Dec), but this carries low confidence. Solar winds starting slightly elevated may become more enhanced on Day 3 (01 Jan) when a faster wind from a coronal hole is likely to arrive. Geomagnetic activity is forecast to be largely Quiet to Unsettled. There is a chance of Active intervals through the period and a slight chance of a G1/Minor Geomagnetic storm, this most likely on Day 3.

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 | 10 | 5 | 20 | 5 |
| 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 | Yes | 20 | 10 | 5 | 1 |
| Very Active | R3 to R5 X | No | 5 | 3 | 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 | 5 | 3 | 3 | 3 |
| Very Active | ≥ S3 * | No | 1 | 1 | 1 | 1 |

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