

Space Weather

Overview

-  Space weather is caused by the interaction of electromagnetic radiation, energetic particles and charged plasma from the Sun with the Earth's Magnetosphere (magnetic field) and upper atmosphere.
-  Solar flares travel at the speed of light causing radio blackouts.
-  Solar energetic particles cause solar radiation storms.
-  Coronal mass ejections (CME) are a large eruption of material which typical take 18-96 hours to reach the Earth and can cause geomagnetic storms.
-  A severe geomagnetic storm is on National Risk Register.
-  Space weather occurs all the time, as illustrated by the aurora and Northern/Southern lights, but events which can disrupt out technology are much less frequent.
-  Space weather is forecast against a 1-5 scale where 5 is the most severe.

Impacts

Space weather impacts include disruption to:

Power grids caused either by damage to transformers or tripping of failsafe systems and resulting in power outages.

Satellite services including global satellite navigation systems such as GPS, which provide position, navigation and timing information for a range of other services.

Aviation due to loss of high frequency communications and increased radiation levels on some routes; particularly trans-polar ones which may be unusable.

Notable space weather events

2003 - Halloween Storm

1989 - Quebec geomagnetic storm

1859 - Carrington Event

Space Weather in the UK

Space weather is a global phenomenon so a significant event will have an impact to the UK and beyond.

Different nations will be impacted to a greater or lesser degree depending on their location relative to the geomagnetic poles, underlying geology, and the technology underpinning their critical national infrastructure.

The Royal Academy of Engineering reported that in the UK disruption to the electricity grid, loss of 10% of the satellite fleet and disruption to transport systems would be experienced during a space weather event.

Space weather is not associated with any other natural hazard.



More information can be found at: www.naturalhazardspartnership.org.uk/hazards/space-weather