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A FUTURE CARRINGTON EVENT: IMPACT ON INTERNATIONAL TELECOMMUNICATIONS

Abstract

The original Carrington event was the result of a solar storm that occurred in September 1859, causing disruption to telegraph networks as well as fires and power shortages. Since then, other solar storms such as the Quebec Power Outage of 1989 and the Halloween Storms of 2003 have impacted the international airline industry, GPS navigation systems, International Space Station (ISS) operations, and even space missions. A future Carrington event would have a large impact on telecommunications networks, as a result of electricity outages, atmospheric disturbance or satellite damage. This would have widespread industrial and societal consequences. A Carrington Event cannot be prevented, nevertheless there are several mitigation strategies that can be implemented to minimize the effects of solar storms. In this paper, the effects of solar storms on communication systems are assessed using a deterministic approach. Following this, existing and developing mitigation strategies are discussed, in addition to the role of the United Nations in coordinating international efforts. Finally, a set of recommendations are provided, pinpointing existing gaps as well as areas of opportunity to improve the preparation and response to an upcoming solar event, thereby reducing the consequences of its impact on telecommunication networks.