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Author: Mr. Temidayo Popoola
Nigerian Meteorological Agency, Nigeria, temi40us@yahoo.com

EFFECTS OF SPACE WEATHER ON AIRLINE OPERATIONS

Abstract

Space weather is the concept of changing environmental conditions in near-Earth space or the space from the Sun's atmosphere to the Earth's atmosphere. Much of space weather is driven by energy carried through interplanetary space by the solar wind from regions near the surface of the Sun and the Sun's atmosphere (chromosphere and corona.), (Wikipedia, 2012). It could also refer to the time-variable conditions in the space environment that may affect technological systems that are either space-borne or ground-based thereby putting human health or life at risk.

In view of the definitions above, this paper attempts to ascertain and analyse the effect of space weather on aircraft, aircrew, avionics as well as humans on the ground.

The ionosphere, an area of the atmosphere which extends from 80 to 1000 km, can significantly affect the propagation of radio frequency (RF) signals which pass through it or are reflected by it (Cannon, 1994a; Cannon, 1994b). Hence, an attempt was made to analyse the effect of space weather on RF propagation.

An attempt was also made to present important similarities and differences between space weather and atmospheric weather which place constraints to present and future space weather service systems both in space and on the ground.

Finally, this paper investigates the socio-economic impacts of space weather on airline operations.