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Poster
The goal of this work is to more accurately define the regions that are hazardous to aviation due to space weather related radiation and turn that knowledge into an application that delivers actionable information to users. Our method for achieving these improvements relies on incorporating real time data from a network of dosimeters known as the Responsive Environmental Assessment Commercial Hosting (REACH) system that monitors radiation from a low altitude satellite constellation. By combining measurements from a large number of satellites, global radiation maps can be produced showing the regions impacted by high energy particles streaming from the sun during a space weather event. The radiation from these events is partly absorbed by Earth’s atmosphere reducing it to negligible levels on the ground; however, at airline altitudes it still poses a potential health hazard to flight crew and frequent flyers that may be subjected to multiple events and accumulate a significant dose over time. To mitigate this hazard, the NOAA Space Weather Prediction Center (SWPC) with guidance from the Federal Aviation Administration (FAA) CARI-7 aviation radiation model issues advisories to the International Civil Aviation Organization (ICAO). The alerts indicate the intensity and geographic regions where radiation is expected to be high. Airlines use this information to divert flights to lower altitudes or latitudes to reduce exposure. Currently, the expected geographic extent of the radiation is based on a statistical compilation of measurements. This statistical model tends to be conservative which may cause unnecessary flight diversions, delays, and increased cost.
Here we present our progress towards developing a method and application to define the high radiation regions based on the REACH dosimeter data rather than the maps derived from historical statistics. We evaluate different methods for filling in global maps using data from 14 satellites. We compare the radiation at airline altitudes based on these new radiation maps to those currently used for alerts during a few significant space weather events. Finally, we discuss plans to incorporate the data into a real time application to deliver the high radiation maps to users.
Poster session day
Tuesday, April 28, 2026
Poster location
5
Meeting homepage
2026 Space Weather Workshop
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