

Radiation dose of aircrews during solar proton events

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A significant enhancement of radiation doses is expected for aircrews during ground-level enhancement (GLE) events, while the possible radiation hazard remains an open question during non-GLE solar energetic particle (SEP) events. Using a new air-shower simulation driven by the proton flux data obtained from GOES satellites, we show the possibility of significant enhancement of the effective dose rate of up to 4.5 uSv/h at a conventional flight altitude of 12 km during the largest SEP event that did not cause a GLE. As a result, a new GOES-driven model is proposed to give an estimate of the contribution from the isotropic component of the radiation dose in the stratosphere during non-GLE SEP events. We show further development of our radiation dose model with some applications, including the most recent GLE 72 occurred on 16 Jan 2014.

Keywords: solar proton events, radiation dose