



## **A new tool for radiation exposure calculations in aircraft flights during disturbed solar activity periods**

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Galactic cosmic rays and solar energetic particles can penetrate the Earth's atmosphere and interact with its molecules, which can cause atmospheric showers of secondary particles that are detected by ground based neutron monitor detectors. The cascades are of great importance for the study of the radiation exposure of aircraft crews. A new Geant4 software application is presented based on DYASTIMA (Dynamic Atmospheric Shower Tracking Interactive Model Application), which calculates the effective dose that aviators may receive in different flight scenarios characterized by different altitudes and different flight routes, during quiet and disturbed solar and cosmic ray activity. The concept is based on Monte Carlo simulations by using phantoms for the aircraft and the aviator and experimenting with different shielding materials.