Panels (P)
International Space Weather Action Team - a Global Network of Research Teams Targeting Improvements of Resilience to Space Weather (PSW.5)
Consider for oral presentation.

PROGRESS TOWARDS AVIATION RADIATION MONITORING

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ARMAS Dual Monitor
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The aerospace environment has several sources of ionizing radiation. Exposure to this radiation is one of the natural hazards faced by aircrew, high-altitude pilots, frequent flyers, and commercial space travelers. Galactic cosmic rays (GCRs) and solar energetic particles (SEPs) almost always are the most important sources of ionizing radiation, particularly when traveling at or above commercial aviation altitudes (8 km or 26,000 ft). GCRs originate from outside the solar system and consist mostly of energetic protons with some alpha particles and a few heavier ions such as iron. SEPs originate on the Sun and are similar in composition to GCRs, being predominantly protons but with relatively fewer heavier ions. Recent measurements also suggest that secondary bremsstrahlung gamma-rays from precipitating Van Allen Belt relativistic electrons may also contribute dose at aviation altitudes. Regardless of their sources, charged particles transit Earth's magnetosphere and interact with its atmosphere depending upon cutoff rigidity where the Earth's magnetic field acts like a high-pass filter. During normal geomagnetic conditions, cutoff rigidity varies approximately inversely with geographic latitude; only particles with relatively high rigidity can make it to the atmosphere at latitudes near the equator, while even the lowest rigidity particles can enter the atmosphere at the geomagnetic poles. As a result, the largest primary radiation fluxes enter at high latitudes, with maxima surrounding the geomagnetic poles. We describe the ISWAT workshop results reviewing the state-of-art for aviation radiation monitoring and report the first results of the ARMAS Dual Monitor project demonstrating 24/7 monitoring as well as improved understanding of the particles and processes that create the aviation radiation environment.