

## Space Weather Services of the Future: Estimating Radiation for Aviation

JOSEPH KUNCHES

*NOAA Space Environment Center*

The continuing-to-grow market for commercial airline flights over the poles has fueled an increasing interest and sensitivity to space weather. Energetic particles, accelerated by flares and CME-driven shocks, cause increased radiation and HF communications outages in the polar regions. In addition, a disturbance in the geomagnetic field that will often occurs in conjunction with these events causes the boundary of the impacted region to expand toward the equator, making the affected volume much larger as well as more affected. Radiation increases are not confined to the polar regions, as the Halloween Storms of 2003 have shown, but the increases are the most acute nearer the poles. This presentation will assess how the current user market – the airlines – is expanding the number of polar flights, and explore a methodology to incorporate output from an effort to model the real-time radiation environment at aircraft altitudes. The prototype model, Nowcast of Atmospheric Ionizing Radiation for Aviation Safety (NAIRAS), is being developed by NASA Langley Research Center (LaRC), in conjunction with the NOAA Space Environment Center (SEC). It is SEC's role as the U. S. government's official source of space weather alerts, warnings, and watches, to make this information available in real-time to the users. An outlook on how this information will be incorporated into the air transport system of the future will be presented.