



Radio science challenges in space weather for aviation

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In many sectors operational Space Weather initiatives aim, among the others, to forecast, nowcast and mitigate the impacts of solar variability on biological and technological systems. In the aviation sector the major interest is related to the radiation level at flight altitudes and the impacts on the performance of radio systems used for communication and navigation. With continuously increasing of global air traffic the International Civil Aviation Organization (ICAO) has acted to incorporate safety from space weather into its aviation regulations. The 7th of November 2019 three global service centers started operational monitoring of space weather with the task to provide aviation community with advisories in the case of strong solar storms. This operational space weather service for aviation needs to translate the latest and highest fidelity research results into new forecasting models and prototype tools, in advance of their implementation as operational services. In this context whilst there is growing investment in space weather research and in space weather service providers less focus is placed upon the often significant challenge of bridging the gap between the latest research and the implementation of new and improved operational services. As use case in this paper we describe how ICAO space weather services have been built and are maintained by the PECASUS (Partnership for Excellence in Civil Aviation Space weather User Services) consortium and we would stimulate a discussion on how the application of excellence in radio research could support operation space weather service useful for aviation and for other industrial and economic sectors.