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USE OF SPACE TO MITIGATE THE IMPACT OF CLIMATE CHANGE ON AERONAUTICS AND AVIATION

Abstract

The history of aeronautics and the development of commercial aircraft is extremely related to climate facts. As an example, mono-wings metallic aircraft were preferred to airships in the past century for many reasons, once being the possibility to pressurize the cabin making the flight at high altitude possible. Nowadays, climate change not only is driving new design perspectives, but also has a role on aviation business and economics. Climate change is increasing global-mean tropospheric temperatures, but the localised trends are uneven [1]. The wind speeds are also being modified, both at the surface and aloft. Furthermore, we experience more and more severe fluctuations and extreme weather. These effects are known to have a role on increased take-off distances where excess runway lengths exist and reduced payloads where they do not, increased en-route flight times, increased frequency and severity of encounters with clear air turbulence in some regions. Also, climate changes push wildlife activity modifications in some regions that are shifting locations of flight safety hazards, with increased burdens upon airport and associated infrastructure [2]. A multi-disciplinary research effort by scientists, meteorologists, climatologists, engineers, is now needed to understand better the impacts of the changing climate on the entire aviation system, including aircraft and infrastructure. In this scenario, space activities may have a disruptive role.

REFERENCES [1] ICAO Secretariat, Burbidge, R., Freeburg, A., Scavuzzi, J., Lacoin, S. and Ozeren, U. 2019. '2019 Environmental Report, Aviation and Environment, Destination Green The Next Chapter, Ch7 Climate Adaptation Synthesis'. Doc 10126. [2] Gratton G.B., Williams P.D., Padhra A. and Rapsomanikis S. (2022). Reviewing the impacts of climate change on air transport operations. The Aeronautical Journal, 126, 209–221.