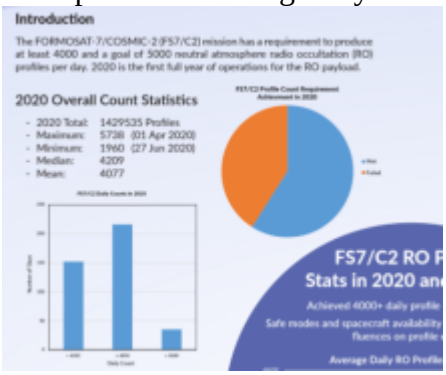
William
Gullotta
NOAA
Gavin James, University Corporation for Atmospheric Research
Mike Perotta, University Corporation for Atmospheric Research
John Braun, University Corporation for Atmospheric Research
Wei Xia-Serafino, NOAA
Poster
Abstract: The FORMOSAT-7/COSMIC-2 (FS7/C2) mission has a requirement to produce at least 4000 neutral atmosphere radio occultation (RO) profiles per day. Pre-launch analysis also suggested that the constellation should be capable of routinely achieving over 5000 profiles on a day. During 2020, FS7/C2 achieved 4000 profiles on 216 days, with an average of 4062 counts per day, and exceeded 5000 on 35 days. Additionally, each individual spacecraft produced over 1000 profiles a day numerous times throughout the year 2020. Examination of under-performing days showed that there were several sources of loss leading to inability to achieve profile count, the largest of which were: safe mode events, orbital transfer maneuvers, and issues with the mission payload. Safe mode events had the most significant negative impact on profile count performance. However, analysis showed that the number of days spent in safe mode reduced for spacecraft in the lower altitude final mission orbit compared to those in the higher parking orbit, and the number of profiles lost to this issue is expected to decrease from Full Operational Capability (FOC) until end of mission. Additionally, now that all spacecraft are in the final orbit configuration, minimal maneuvers should be required, thereby nearly eliminating the second largest negative impact. Issues with the mission payload were the final source of profile count reduction and are being addressed through progressive software updates to the instrument. Given the expected reduction in safe modes and orbit transfers as well as software improvements to the mission payload, it is expected that FS7/C2 will achieve the 4000 profile count requirement more consistently in 2021 and produce 5000 profiles more regularly than in 2020.



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