

EGU2020-20170

<https://doi.org/10.5194/egusphere-egu2020-20170>

EGU General Assembly 2020

© Author(s) 2022. This work is distributed under the Creative Commons Attribution 4.0 License.



COSMIC-2 Precise Orbit Determination Results

Jan-Peter Weiss, Doug Hunt, William Schreiner, Teresa VanHove, Daniel Arnold, and Adrian Jaeggi
University Corporation for Atmospheric Research, COSMIC Program, Boulder, United States of America (weissj@ucar.edu)

We present results for GNSS orbit estimation strategies implemented for the FORMOSAT-7/COSMIC-2 (Constellation Observing System for Meteorology, Ionosphere, and Climate) constellation. The six COSMIC-2 satellites launched on June 25, 2019 into a 24 deg inclination, ~725 km circular orbit. Over time, all satellites will be lowered to an operational altitude of ~520 km. The primary COSMIC-2 science payload is the JPL designed Tri-GNSS Radio-occultation Receiver System (TGRS), which tracks GPS and GLONASS signals on two upward looking choke-ring precise orbit determination antennas facing the forward- and anti-velocity directions. We evaluate recently implemented post-processed orbit determination strategies. These include single antenna GPS-only and GPS+GLONASS solutions, as well as experimental dual-antenna GPS-only processing applying different approaches for the handling of receiver clock parameters (e.g. dual clocks, single clock plus bias). Evaluation metrics include data volume and tracking arc coverage, postfit residuals, internal orbit overlaps, and stability of the receiver clock estimates. We furthermore compare the performance of the six orbiters, and look for differences in quality metrics at the higher and lower orbit altitudes.