EGU21-15396
https://doi.org/10.5194/egusphere-egu21-15396
EGU General Assembly 2021

A comparative study of different tropospheric delay solutions applied to GNSS observations of the MOSAiC expedition.

Pierre Sakic[1], Benjamin Männel[1], Maximilan Semmeling[2], and Jens Wickert[1,3]
[1]GeoForschungsZentrum GFZ, Space Geodesy Section 1.1, Potsdam, Germany (pierre.sakic@gfz-potsdam.de)
[2]Institute for Solar-Terrestrial Physics (DLR-SO), Neustrelitz, Germany
[3]Institute of Geodesy and Geoinformation Science, Technical University of Berlin, Berlin, Germany

The *Multidisciplinary Drifting Observatory for the Study of Arctic Climate* (MOSAiC) campaign was conducted from September 2019 to October 2020. It aimed to observe the Arctic region's environmental parameters, considered to be the epicenter of the effects of climate change. On this occasion, a multi-GNSS antenna was deployed on the *R/V Polarstern*. This installation aims mainly at estimating tropospheric delays, a proxy for the determination of atmospheric water vapor content. The number of observations of this type in the marine - and moreover polar - domain remains extremely limited so far. This experiment is also a good opportunity to carry out a comparative study of the tropospheric delay solutions that can be provided by different geodetic processing software. The underlying idea is to evaluate the repeatability of the different products and the overall state-of-the-art accuracy. We propose here to process the GNSS data acquired during the polar campaign with several packages (namely Bernese GNSS Software, GINS, TRACK, and CSRS-PPP) and compare the results and their agreement level. The data are also validated from observations made on land by GNSS stations at Bremerhaven (Germany), Tromsø (Norway) & Ny Ålesund (Svalbard), the VLBI station of Ny Ålesund, and the ECMWF ERA5 numerical model.