EGU23-17204, updated on 26 Apr 2023
https://doi.org/10.5194/egusphere-egu23-17204
EGU General Assembly 2023

Modeling of the weighted mean temperature based on the random forest machine learning approach

Qinzheng Li[1,2], Johannes Böhm[1], Linguo Yuan[2], and Robert Weber[1]
[1]Department of Geodesy and Geoinformation, Vienna University of Technology (TU Wien), Wien 1040, Austria
[2]Faculty of Geosciences and Environmental Engineering, Southwest Jiaotong University, Chengdu 611756, China

Atmospheric weighted mean temperature, T_m, is an important parameter in the Earth's atmospheric water vapor sounding with the Global Navigation Satellite System (GNSS) technique. In this study, considering spatial distribution, time-varying characteristics, and the correlation with surface meteorological variables, T_m modeling is realized based on the random forest (RF) machine learning and global atmospheric profiles from radiosonde (RS) data and GPS radio occultations (RO) measurements. Comparisons of modeled results and numerical integrations of atmospheric profiles in 2020 show that the RF-based T_m model with surface meteorological parameters generally obtains a good accuracy with overall RMS errors of 2.8 K in comparison with RS data and 2.6 K in contrast to GPS RO data.