

EGU22-10562

<https://doi.org/10.5194/egusphere-egu22-10562>

EGU General Assembly 2022

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



Observed connection between blocking and sudden stratospheric warming events using GNSS radio occultation observations

Kamilya Yessimbet^{1,2}, Albert Ossó¹, Florian Ladstädter¹, and Andrea Steiner^{1,3}

¹University of Graz, Wegener center for climate and global change, Graz, Austria (kamilya.yessimbet@uni-graz.at)

²FWF-DK Climate Change, University of Graz, Graz, Austria

³IGAM/Institute of Physics, University of Graz, Graz, Austria

A better understanding of the dynamics in the upper troposphere and lower stratosphere (UTLS) is important for e.g., improving surface weather predictability. This study focuses on wave propagation in the UTLS and its role in the connection between blocking and stratospheric variability associated with sudden stratospheric warming (SSW) events. We analyse the properties of the quasi-geostrophic Eliassen-Palm (EP) flux in the UTLS using vertically high-resolved Global Navigation Satellite System (GNSS RO) radio occultation observations.

The results show that GNSS RO observations provide detailed information on the vertical structure in the UTLS and are suitable for observing the atmospheric circulation. The EP flux obtained with the GNSS RO is in good agreement with theory and previous studies. We find that SSW is preceded by enhanced EP flux propagating upward in the UTLS, associated with blocking events. In the case of wave reflection, downward propagation leads to blocking over the North Pacific.