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Third-order structure functions of zonal winds in the thermosphere using CHAMP and GOCE observations

As part of the PBASE project, I stayed at Kyushu University in Fukuoka, Japan from October 6 to November 27, 2023. Prof. Huixin Liu acted as a local host and supervisor for my work on using CHAMP and GOCE cross-track wind observations to estimate third-order structure functions.

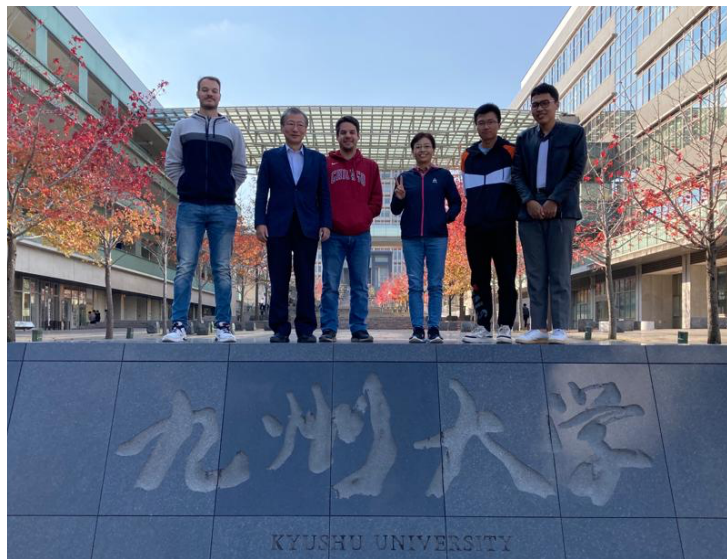
The main objective of my work is to analyze high-order statistics of winds in the middle and upper atmosphere, to infer differences and similarities at different altitude levels and scales. For this purpose, a variety of measurement sources can be used. Some of these are radars, lidars, satellites, and aircraft observations. In the past few years, I have mostly focused on the study of these statistics in the mesosphere and lower thermosphere (MLT) region using meteor radar observations. The MLT region is critical for the transition of the neutral atmosphere to space.

The interaction with Prof. Liu has been very fruitful since we managed to combine her expertise on thermospheric winds using satellite observations with my expertise in the above-mentioned topic. The collaboration has led to the elaboration of a manuscript towards the end of my stay at Kyushu University, which we intend to publish soon.

This work would not have been possible if I had not spent time at Kyushu University. Participating in seminars and engaging in discussions with students, postdocs, and other guests of the working group provided me with valuable and intriguing insights into the research activities carried out at the hosting institution.

During my stay at Kyushu University, I resided in the on-campus Ito guest house just minutes away from my office. The university provides various dining options and convenience stores on or near campus. A nearby shopping mall, accessible by a 15-minute bus ride, includes a supermarket and clothing stores. Fukuoka, easily reachable by local transport, offers museums, parks, beaches, and the Fukuoka Castle. Moreover, other cities like Hiroshima (1 hr), Kagoshima (1 hr), and Osaka/Kyoto (2.5 hrs) are quickly accessible by train from Fukuoka main station.

To conclude, my stay at Kyushu University not only yielded significant scientific results of interest to the atmospheric science community and worth reporting in a scientific journal but also enriched me with a cultural experience crucial for both personal and professional development.



Part of Prof. Huixin Liu's (third from the right) working group at Kyushu University. The photo was taken during Prof. Takuji Nakamura's (second from the left) visit. Me: third from the left.