Name: Yosuke Yamazaki

Affiliation: Leibniz-Institute of Atmospheric Physics at the University of Rostock

Empirical Orthogonal Function Analysis of Atmospheric Tides

Prof. Huixin Liu hosted my stay at Kyushu University in Fukuoka from January 8 to February 24, 2025. During this time, we worked on the application of the Empirical Orthogonal Function (EOF) analysis to atmospheric data to determine dominant modes atmospheric tidal variability. Atmospheric tides are global-scale waves that are mainly generated in the lower atmosphere and propagate upward into the upper atmosphere. The characterization of spatial and temporal variability of tides is important, as they can have a significant impact on the space weather. The EOF analysis is a statistical technique for identifying dominant spatial modes and their temporal evolutions, commonly used in the field of meteorology. Our preliminary results show that atmospheric tides in the mesosphere and lower thermosphere (MLT) region can be represented by a small number of tidal modes.

Prof. Liu's group is very international, with a diverse mix of students, postdocs, and visiting researchers from around the world. I enjoyed interacting with them and participating in the weekly seminars. The attached photo was taken after my seminar presentation on 30 January 2025.

Prof. Liu (third from the right in the top row) and her group, with me (to the left of Prof. Liu)

I stayed at the on-campus guesthouse, just a few minutes away from the office, which allowed me to focus fully on my research. We have made significant progress on our project and plan to summarize the key findings in a report, which we will soon submit to an international journal.

Overall, my visit to Kyushu University was a very positive experience. I am grateful to all the support I received from PBASE and Prof. Liu.