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Long- and short-term behavior of Sporadic E: Climatological variability and storm-time perturbations from ground-based datasets

As part of the SCOSTEP Visiting Scholar (SVS) program, and with support from the PBASE grant, I stayed at Kyushu University in Fukuoka, Japan, from October 1st to December 24th, 2025. Prof. Huixin Liu acted as my local host and supervisor, providing guidance throughout the development of my research on long- and short-term variability of the lower ionosphere.

The primary goal of my work was to investigate both the climatological behavior and the storm-time response of the sporadic E layer (Es). During my stay, I conducted the study of the long-term behavior of foEs, using datasets from low-, mid-, and high-latitude stations. I gathered data from multiple databases, performed data cleaning, applied quality control criteria, and analyzed the relationship between foEs and the solar cycle. This component focused on over 30 years of observations, aiming to characterize the climatological variability of the E region.

As a complementary project, I investigated short-term foEs perturbations during different geomagnetic storms. For this analysis, I used high-temporal-resolution datasets over several days to quantify storm-time enhancements and compare the responses across different latitudes.



Fig: Snapshots of wonderful moments in Japan

Towards the end of my stay, we began preparing a manuscript summarizing the results obtained. We expect to submit this work for publication in the near future.

Beyond the scientific outcome, my time at Kyushu University allowed me to share my research and engage with colleagues and students. Every week, we held laboratory seminar meetings, which offered valuable opportunities for discussion and feedback.

On a personal level, my stay in Japan was deeply enriching. Every weekend, I took the opportunity to explore different aspects of Japanese culture. I visited museums, temples, the onsen and parks in Fukuoka, and traveled to Hiroshima and Kumamoto. I enjoyed discovering traditional Japanese food and trying as many local specialties as possible. I was truly captivated by the culture, landscapes, and hospitality I encountered.

Overall, my stay at Kyushu University was an excellent experience that supported my Ph.D. goals and enriched my personal and professional development. I am very grateful for the opportunity and for the support and kindness I received in Japan.