

Name: Lynne Githio

Affiliation: Egypt-Japan University of Science and Technology (E-JUST), Alexandria Egypt.

Investigating the Ionospheric Response to Stratosphere Sudden Warming

I was a recipient of the SCOSTEP Visiting Scholar (SVS) program, which gave me the opportunity to visit Kyushu University in Fukuoka, Japan, from December 3, 2024, to February 24, 2025. Prof. Huixin Liu hosted and supervised my research during this period.

The aim of my research was to investigate the ionospheric response to Sudden Stratospheric Warming (SSW). Specifically, we analysed how key ionospheric parameters, including foF2, hmF2, and h'F respond to SSW. We utilized reanalysis data of SSW precursors from 1995 to 2021 and obtained a total of 24 SSW events. Also, we applied various machine learning regression models—including Random Forest, eXtreme Gradient Boosting (XGBoost), and Long Short-Term Memory (LSTM) networks—to model and predict the influence of SSW-induced stratospheric changes on ionospheric parameters. Further analysis of this work is still underway, and we intend to prepare a manuscript and publish it soon.



A photo of Prof. Liu (fourth from the right) and her research group, with me (second from the right), during an afternoon run to the beach near Kyushu University.

During my stay at Kyushu University, I lived in the Ito-Harmony House University dormitory, about a 15-minute walk from the main campus. On weekdays, I conducted research in the lab and participated in weekly seminar discussions with students and visiting researchers. Prof. Liu's lab has a diverse group of students from different countries, and I was honoured to be her first guest student from Africa.

Over the three months, I made many friends, and on weekends, we explored nearby towns, including Hakata and Sasebo, and even visited Hiroshima. My time at Kyushu University was an incredible experience—I had the opportunity to work in a new research environment, immerse myself in diverse cultures, and try different foods.

I am sincerely grateful to Prof. Liu and the PBASE team for granting me this once-in-a-lifetime opportunity to visit Kyushu University and for their unwavering support throughout my stay.