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Report on Academic Visit to the International Research Center for Space and Planetary Environmental Science (i-SPES), Kyushu University

With support from the PBASE program, I spent about three months at the International Research Center for Space and Planetary Environmental Science (i-SPES) in Fukuoka, Japan, working under the supervision of Yoshikawa Sensei and Uozumi San. I also visited the Kuju MAGDAS ground station. During this period, I focused on learning how geomagnetic data are recorded and used in space weather research. I gained a detailed understanding of how the instruments at Kuju station operate, how geomagnetic field variations are continuously monitored, and how the raw data are processed and stored. Under their guidance, I received hands-on training in handling, visualizing, and analyzing MAGDAS ground-based data, greatly enhancing my practical skills in working with long-term geomagnetic observations.

During my stay, I also examined how solar flare events affect Earth's magnetosphere by combining space-based and ground-based observations. I used data from soft X-ray, magnetic field, and energetic particle sensors (EPSs) on the GOES satellites (GOES-13 and GOES-15) to detect solar flare events and compare their timing and features with geomagnetic responses recorded at the MAGDAS station. This combined method helped me understand how sudden increases in solar radiation are shown in ground magnetic changes and explore possible connections to magnetospheric activity.

Working directly with MAGDAS data at a ground station, along with ongoing support from Yoshikawa Sensei and Uozumi San, has given me a much clearer understanding of the entire data process, from instrument operation and local recording at the ground station to scientific analysis. I have learned a lot over these three months, both technically and scientifically. These skills will significantly benefit my current and future research on solar—terrestrial coupling. I am grateful for this opportunity and for the guidance and support I've received during my stay. I look forward to further collaborative research building on this foundation.