

# An observing system simulation experiment for FORMOSAT-5/AIP probing topside ionospheric plasma irregularities by using DEMETER/IAP

Jann-Yenq Liu<sup>1,2</sup>, \*Yang-Yi Sun<sup>1</sup>, Chi-Kuang Chao<sup>1</sup>, Shih-Ping Chen<sup>1</sup>, Michel Parrot<sup>3</sup>

1. Graduate Institute of Space Science, National Central University, Taoyuan, Taiwan, 2. Center for Space and Remote Sensing Research, National Central University, Taoyuan, Taiwan, 3. LPCE/CNRS, Orleans, France

In this paper, the ion density probed by IAP (Instrument d'Analyse du Plasma) on board the DEMETER (Detection of Electro-Magnetic Emissions Transmitted from Earthquake Regions) satellite is used to find whether the science payload of advanced ionospheric probe (AIP) on board FORMOSAT-5 can be employed to observe space weather of ionospheric plasma irregularities. It is found that the low-latitude irregularities within  $\pm 15^\circ$  dip latitudes of the DEMETER/IAP ion density are nighttime phenomena, and become prominent in South America–Central Africa sector almost all the year round, especially during May–August. The high-latitude irregularities of the DEMETER/IAP ion density appear around  $\pm 65^\circ$  dip latitude worldwide in both daytime and nighttime, and become very intense in the winter and equinox month/hemisphere. Results of DEMETER/IAP show that FORMOSAT-5/AIP can be used to monitor space weather of ionospheric daytime/nighttime plasma irregularities in not only the low- but also high-latitude ionosphere.

Keywords: FORMOSAT-5/AIP, DEMETER/IAP, ionospheric plasma irregularity