S002-P10
ポスター 1 ：11/24　PM1/PM2 （13:15-18:15）

2024 年 5 月の磁気嵐中に日本で観測された全電子数増大及び電子密度擾乱

#大塚 雄一 [1)], 塩川 和夫 [1)], 新堀 淳樹 [1)], 山本 衛 [2)], 横山 竜宏 [2)], 西村 耕司 [2)], 西岡 未知 [3)], Perwitasari Septi[3)]
([1] 名古屋大学宇宙地球環境研究所, [2] 京都大学生存圏研究所, [3] 情報通信研究機構

Total Electron Content Enhancement and Irregularities Over Japan During a Magnetic Storm on May 2024

#Yuichi Otsuka[1)], Kazuo Shiokawa[1)], Atsuki Shinbori[1)], Mamoru Yamamoto[2)], Tatsuhiro Yokoyama[2)], Koji Nishimura[2)], Michi Nishioka[3)], SEPTI PERWITASARI[3)]
([1]Institute for Space-Earth Environmental Research, Nagoya University, [2]Research Institute for Sustainable Humanosphere, Kyoto University, [3]National Institute of Information and Communications Technology

In May 2024, a super geomagnetic storm with a SYM-H minimum value of -512 nT occurred. This study analyzes global Total Electron Content (TEC) obtained from Global Navigation Satellite System (GNSS) receivers, thermospheric neutral wind from a Fabry-Perot interferometer (FPI) in Darwin, Australia, and plasma drift velocity observed by the MU radar in Shigaraki, Japan. The GNSS-TEC map shows that TEC enhancement with an amplitude of approximately 20 TECU appeared around (40°N, 150°E) at approximately 12 UT (21 JST) on May 11, 2024 and extended northwestward. This feature is similar to Storm-Enhanced Density (SED). After 13 UT (22 JST), ionospheric irregularities, indicated by the Rate Of TEC change Index (ROTI), were observed at the poleward edge of the TEC enhancement. The ROTI enhanced region also extended northwestward. Simultaneously, ROTI enhancement also appeared over Australia in the southern hemisphere, suggesting a geomagnetic conjugate structure of the ROTI enhancement. Zonal winds observed by the FPI in Darwin were approximately 80 m/s westward on average from 13 to 20 UT on May 11. The zonal plasma drift velocity observed by the MU radar in Japan was approximately 70 m/s westward at 13 UT (22 JST). We found that TEC depletions are embedded within the TEC enhancement and coincide with ROTI enhancement, indicating the presence of plasma bubbles. These results suggest that the westward extension of the TEC enhancement and the plasma density irregularities could be caused by westward ExB plasma drift driven by westward disturbance winds. From the temporal variation of the ROTI enhancement on the global map, we find that the ROTI enhancement is initiated around the magnetic equator at a longitude of 180° E around 8 UT (local post-sunset) and moves westward, extending poleward. These results suggest that plasma bubbles generated at the magnetic equator during local post-sunset extend to higher latitudes and that both the plasma bubbles and the surrounding dense plasma move westward due to ExB plasma drift caused by the westward disturbance winds.