

Variation of Te and Ti observed by DEMETER during 2009 total solar eclipse

Kaori Mochizuki^{1*}, Masashi Kamogawa¹, Jean-Jacques Berthelier², Tatsuo Onishi²,
Yoshihiro Kakinami³, Wang Xiaoni²

¹Dpt. of Phys., Tokyo Gakugei Univ., ²Laboratoire Atmospheres, Milieux, Observ.,

³Institute of Space Sci., National Centre for Space Science and Space Technology

We investigate ionospheric dynamics of 2009 total solar eclipse in East Asia by using Ne/Te and Ni/Ti data of French satellite DEMETER, of which altitude is around 660 km. On July 22, 2009, one of DEMETER orbits crossed eclipse zone, and the distance closest to the total eclipse area was approximately 200km. Just before the total solar eclipse, middle-scale traveling ionospheric disturbance (MSTID) over Japan occurred from GPS-TEC data. At the same time, DEMETER also recorded decrease of Ne and Ni associated with MSTID. After MSTID, however, Te and Ti decreased due to a shadow of the moon when the satellite entered eclipse zone. After that, Ne and Ni enhanced possibly associated with eclipse-origin gravity waves traveling along the magnetic field line. In the presentation, we discuss quantitatively ionospheric dynamics during the total solar eclipse.

Keywords: Total solar eclipse, Ion density, Electron density, Gravity wave