

English Variation of Ne and Ni observed by DEMETER during the solar eclipses

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We investigate ionospheric dynamics of solar eclipses during French satellite DEMETER operation by using Ne/Te and Ni/Ti data of French satellite DEMETER, of which altitude is around 660 km. In particular, 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 addition, we compare the results in East-Asia and with other eclipses.

Keywords: Total solar eclipse, Ion density, Electron density