

The mechanism of the formation of the electron density height profile obtained in the WAVE2000 campaign

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The electron density height profile has been obtained by the rocket experiment operated as a part of WAVE2000 campaign. The profile shows some density peaks which are corresponded to the shear regions of both the zonal (92 km) and meridional (84 km) winds. It is difficult to produce the electron density peak by the meridional wind shear in lower E region because of high collision frequency. There are also some density peaks in the atomic oxygen profile obtained by the same rocket experiment. We are going to explain these density peaks considering another mechanism such as vertical winds.

The electron density was measured by the two Langmuir probes onboard the rocket S-310-29 as a part of the WAVE 2000 campaign. The rocket was launched from Kagoshima Space Center (31.25N, 131.08E) at 05:50 JST, 10th, Jan., 2000. The wavy structure including week multiple sporadic E (Es) layers were shown in the electron density profile, whose wavelength is about 10 km. The profile shows some density peaks which are corresponded to the shear regions of both the zonal (92 km) and meridional (84 km) winds measured by the MF radar in Yamagawa (31.20N, 130.62E). It is difficult to produce the electron density peak by the meridional wind shear in lower E region because of high collision frequency. There are also some density peaks in the atomic oxygen profile obtained by the same rocket experiment. We are going to explain these density peaks considering another mechanism such as vertical winds.