Discussion on the wind velocity fluctuations observed with foil chaff experiment

Yoshiko Koizumi[1], Manabu Shimoyama[2], Koh-ichiro Oyama[3], Yasuhiro Murayama[4]

[1] Earth and Planetary Sci., Univ. of Tokyo, [2] Earth and Planetary Phys., Univ. of Tokyo, [3] ISAS, [4] CRL

Foil chaff experiment using a sounding rocket S-310-29 was carried out at 0550JST on the 10th January 2000. The foil chaff were tracked in the height range of 95.0-88.5km and the velocity and direction of the neutral wind were obtained.

The wind profiles suggest the existence of the periodic fluctuations. FFT analysis shows that the wind fluctuations in meridional component are not remarkable in comparison with in zonal and vertical component.

The vertical wavelength observed is too small to be explained by the generally observed gravity waves. However, there is a possibility for small scale internal gravity wave to exist. We discuss here the possibility above, and at the same time, we also discuss whether these small fluctuations can be erroneously produced by radar tracking.

Foil chaff experiment using a sounding rocket S-310-29 was carried out at 0550JST on the 10th January 2000, from KSC, Uchinoura, Japan. About 20,000 pieces of foil chaff were ejected during the downleg of the rocket, around the height of 100km, 341sec after the launch. The foil chaff were tracked in the height range of 95.0-88.5km by a primary radar and the velocity and direction of the neutral wind were obtained.

The results are as followings. Zonal wind blows 30m/s to the west and 30m/s to the eastward in the height range from 94km to 89km with shear at the height of 91.5km. But meridional wind is about 50m/s in all height range. The rapid change exists at the height of 90.5km both in zonal and vertical wind motions. The wind profiles suggest the existence of the periodic fluctuations. FFT (Fast Fourier Transform) analysis shows that the wind fluctuations in meridional component are not remarkable in comparison with in zonal and vertical component.

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