

Measurement of neutral wind using foil chaff technique by sounding rocket S-310-38

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The neutral winds in the mesosphere and lower thermosphere were measured by a sounding rocket S-310-38, which was launched at 18:14:40JST on the 6th February 2008, from Uchinoura Space Center (USC), Japan. The main purpose of this rocket experiment is to study the three-dimensional structure of the electron density in the ionospheric E region. The foil chaff experiment aimed at measuring zonal wind shear and instability in the neutral atmosphere. The formation of sporadic E layer is caused by zonal wind shear based on the wind shear theory. The instability in the neutral atmosphere is considered to modulate the ionized atmospheres.

Aluminum-evaporated plastic foil is used as foil chaff, which is 25 mm in length, 5 mm in width, and 1 micron thickness. In this experiment, about 15,000 foils were successfully ejected at the altitude of about 110 km during the descent of the rocket, which was 298 seconds after launch. The foil chaff was tracked by the radar for about 5 minutes, and then the velocity and direction of the neutral wind were obtained. In the presentation, we will show the results from the rocket experiment, and compare with the spatial structures of the E region plasma.