The Future Rocket Experiment by Using an Instrument to Measure Vibrational-Rotational Temperature of Molecular Nitrogen

Junichi Kurihara[1], Koh-ichiro Oyama[2], Katsuhisa Suzuki[3]

[1] Earth and Planetary Phys., Univ. of Tokyo, [2] ISAS, [3] Education and Human Sci.,Yokohama Natl.Univ.

http://www.ted.isas.ac.jp/~kuri/

The vibrational temperature, the rotational temperature and the density of molecular nitrogen in the lower thermosphere between 100 - 160 km were measured by a sounding rocket S-310-24, over Uchinoura, Kagoshima, Japan, on February 11, 1996. The experiments brought us more than those we had expected. However, we believe that for the future rocket experiments further improvements of the instrument should be done such as the increase of the sensitivity of photospectrometer and the increase of the electron gun emission. In this paper, we will theoretically discuss several factors for further improvements of the instrument and the laboratory results which were conducted according to the theory. The rocket experiment by S-310-30 rocket which is planned in January 2001 will also be described.

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