

Estimation of electron density profile in the ionospheric E region by S-310-38 sounding rocket

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The S-310-38 sounding rocket was launched from Uchinoura Space Center (USC) at 18:14:40 (JST) on February 6, 2008. The purpose of this experiment is the investigation of spatial structure of ionospheric E region when the sporadic E region is arising. The LF/MF band radio receiver is installed on S-310-38 sounding rocket. This receiver measures the intensities of two radio waves transmitted from NHK Kumamoto broadcasting station (873 kHz, 500 kW) and JJY signal from Haganeyama radio station (60 kHz, 50 kW). The approximate electron density profile can be determined from the comparison between the propagation characteristics of radio waves measured by the sounding rocket and those calculated by the full wave method. The JJY signal (60 kHz radio wave) propagates above the reflection altitude so that 60 kHz radio wave changes the whistler mode wave at the its altitude. The most probable electron density profile over Uchinoura could estimate using the propagation characteristic of two radio waves and the full wave method. The electron density detailed structure at altitude from 110km to 130km, where the other instruments could not observe, can obtained in this estimation. We will present the propagation characteristics of radio waves during the rocket experiment and the estimated electron density profile in the ionosphere.