

## Observation of exosphere by Ultra Violet Imaging Spectrometer (UVS) on NOZOMI spacecraft

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NOZOMI spacecraft is orbiting near the earth orbit, and its arrival at Mars will be in last 2003. Ultra violet Imaging Spectrometer (UVS) is one of the instruments of the spacecraft. UVS consists of 2 instruments, Grating Spectrometer (UVS-G) and Hydrogen and Deuterium Absorption Cell Photometer (UVS-P). The objects of research by UVS are to investigate the interaction between Martian atmosphere and solar wind, Local Interstellar Cloud(LIC) and Martian hydrogen/oxygen coronas.

The UVS-G is a flat-field type spectrometer, in which FUV region from 115 to 200 nm can be detected by micro-channel plate(MCP) with strip anodes, and MUV region from 200 to 300 nm can also be detected by linear image sensor(LIS), with a spectral resolution of 2-3 nm. On the other hand, UVS-P is a photometer capable of separately detecting hydrogen and deuterium Lyman alpha emissions. H and D Lyman alpha emissions, 121.567 nm and 121.534 nm respectively, are so close each other that small spectrometers like the UVS-G can not resolve them. By using H and D cell, the intensities of H and D Lyman alpha emissions can be measured separately.

Before arriving at Mars, we have to estimate in detail the sensitivity, noise and contamination of UVS-P/G in interplanetary space. We have carried out the analysis of geocorona observed by UVS, which measured Lyman alpha emissions of 121.56 nm from geocorona, interstellar cloud and moon in the period of september 24 1998's moon flyby. However, UVS-P observed only geocorona because of stray light from sun. UVS-P switched H cell filament turn on/off.

The geocorona observation showed that the existence of hydrogen geocorona extended up to 10000 km altitudes. We estimated the temperature from the altitude distribution of hydrogen density and found that the temperature is about 10000 K.

From the assumption that the Lyman alpha emissions of LIC include no effect of oxygen emissions of 130.4 nm, we estimated the distribution of oxygen geocorona by subtraction of the Lyman alpha emission from geocorona emission.

The method of the analysis will be used to investigate Martian oxygen corona. We compared the data of UVS-P's H cell filament on with that of filament off and confirmed Lyman alpha absorption by geocorona.