

## Evaluation of hydrogen absorption cells for observation of the planetary coronas

# Masaki Kuwabara[1]; Makoto Taguchi[2]; Kazuo Yoshioka[3]; Tokio Ishida[2]; Shingo Kameda[4]; Ichiro Yoshikawa[5]  
[1] The Univ. of Tokyo; [2] Rikkyo Univ.; [3] The Univ. of Tokyo; [4] Rikkyo Univ.; [5] EPS, Univ. of Tokyo

Atomic hydrogen in the planetary exospheres resonantly scatters the solar Lyman-alpha emission at the wavelength of 121.567 nm forming planetary coronas. Imaging of the hydrogen corona allows us to probe a density distribution of the atomic hydrogen. The hydrogen absorption cell technique is a strong tool for the imaging of planetary coronas, because it enables us to obtain not only intensity distributions of the hydrogen coronas but also temperature distributions and D/H ratios, which are key parameters for estimating amount of planetary water lost in the past. Hydrogen absorption cells of which the clear aperture is enlarged to be twice as large as that of the cells for UVS-P onboard the Japanese Mars orbiter NOZOMI have been developed. We measured absorption profiles of them using the DESIRS beamline at Synchrotron SOLEIL in France, and evaluated dependences of optical thicknesses and FWHMs of the absorption profiles on 1) length and diameter of filaments, 2) filament temperature, 3) hydrogen gas pressure, 4) position of a beam in the cell, and 5) path length in the cell. A spare deuterium cell for NOZOMI/UVS-P was also reevaluated. Application of the absorption cell technique for future planetary missions will be also presented.