

Development of a Fabry-Perot Imaging System for Planetary Observation

Shoichi Okano[1], Takeshi Sakanoi[2], Hiroaki Misawa[3], Akira Morioka[4]

[1] PPARC, Tohoku Univ., [2] PPARC, Grad. School of Sci., Tohoku Univ., [3] Planet. Plasma and Atmos. Res. Cent., Tohoku Univ., [4] Planet. Plasma and Atmos. Res. Cent., Tohoku Univ.

Design of a Fabry-Perot imaging system, which aims observation of spatial distribution of intensity and Doppler quantities of emissions from sulfur ion in Io plasma torus and sodium in Jovian nebula with extremely high wavelength resolution, has been made.

Optical observation of weak emissions in planetary upper atmosphere from the ground is difficult, particularly in visible range, due to strong background scattering of solar radiation from the planetary disk and the lower atmosphere. In order to observe a planetary spectral line emission suppressing such strong background continuum, extremely narrow band spectroscopy is essential. If the bandwidth is sufficiently narrow, observation of Doppler width and shift of the emission line becomes possible, enabling us to study dynamics of the emitting species, like temperature and wind component along the line of sight.

For this purpose, we started development of a Fabry-Perot imaging system for planetary observation. Detail of the system design and expected performance will be given.