1. Introduction

In the Jupiter polar stratosphere, there is stratospheric haze that formed by scattering aerosol particles (Fig. 1.1). This structure can be seen as bright cap at deep methane absorption band (889 nm), whose edges show a wave structure propagating in the longitudinal direction in latitudinal range of 60° S - 70° S.

Observations with the HST and Cassini ISS showed that those wavenumbers were 12 - 14 and westward velocity of the wave structure in System III was 0 - 10 m/s [Barrado-Izagirre et al., 2008].

In the previous works, the propagation velocity of this wave was shown, but the variance of short time (monthly and weekly) and the wave structure in the vertical direction aren’t clear.

2. Observation

We have observed Jupiter since 2011 with the 1.6 m Pirka telescope and Multi-Spectral Imagery (MSI). We can observe images at multiwavelength (infrared and visible wavelength regions) with a short time exposure, which enables a high spatial resolution. (longitude of Jupiter’s zonal winds and their meridional variation. Especially 727 nm sometimes has a relatively high correlation with 750 nm. A high correlation with 889 nm and 727 nm reflects that the sensitivity altitude of 889 nm is near that of 727 nm. The wave structure in the stratosphere wasn’t seen in the troposphere.)

3. Analysis

We produce Jupiter images by composite of the serial of short exposure frames for reducing atmospheric turbulence. Number of Jupiter images can get information of Jovian cloud and haze in the different altitude using observation at wavelengths that absorption by methane are different.

4. Results & Discussion

1. Time variation

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4. Results & Discussion <Time variation>

We get the wave structure at three or four wavelengths each observational days and calculate the cross-correlation function of the wave structure at each wavelength.

Fig. 4.2 Jupiter Spectrum by the European Southern Observatory [Karkoschka, 1994]

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In decreasing order of the sensitive altitude is 889 nm, 727 nm, 619 nm, 750 nm.

Observational Sensitivity wave length altitude

889 nm 361 mbar: tropopause
727 nm
619 nm
750 nm 750 mbar: deep troposphere

The positive and negative peaks didn’t move in longitude.(red lines in Fig. 4.1)

In 2011, there was variation of this wave amplitude seen in some specific longitudes (blue arrows in Fig. 4.1).

It was possible that another structure whose size is less than longitude of 15 degree (The half wave length of number of member) affect this wave structure.

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5. Conclusions & Future Work

We investigate the wave behavior at the polar regions between 2011 and 2015. It becomes clear that (1) The variation of wave amplitude was found within ten days. It was possible that another structure affect this wave structure. (2) The wave structure at 889 nm and 727 nm are usually similar. This structure wasn’t seen in the deep troposphere.

In the future work, we will analyze meridional variation of Jupiter and restrict the wave structure at 67° S in meridional direction.