

The wave structure in Jupiter's polar region and the asymmetric distribution of the polar cup haze

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In the Jupiter stratosphere, the polar cup hazes exist in the both hemispheres whose edges show the wave structure. Previous observations, such as by Cassini ISS in 2000 or the Hubble Space Telescope (HST) from 1994 to 1999 [Barrado-Izagirre *et al.*, 2008], show that the polar region is covered by bright diffuse haze and its edge has a wavy structure spreading in longitudinal direction with wavenumber of 12 -14 at 67° S, which travels westward with a phase velocity of 0- 10 m/s. These observations suggested that this wave structure is caused by a planetary Rossby wave. However, these observations had been carried out only every other year and the variance of short time scale (about month) is not clear. The spatial range of this wave structure have not been investigated. The aim of this study is to clear dynamics of the wave structure which vary within few days or few weeks. This is achieved by the continual observation using a methane absorption band filter at 889 nm installed at Multi-Spectral Imager (MSI) of the 1.6 m Pirka telescope. To investigate spatial structure of this wave, we measure the boundary of the low-latitude side of the wave. We also clear the vertical structure in polar region using observation at wavelengths that absorption by methane are different. In addition, identify of distribution of the haze structure is also purpose of this study.

In this presentation, we introduce the observational results of time variation of the wave structure in Jupiter's south polar region in 2011 to 2015 by the ground-based telescope. Each result is separated by few days to few weeks. Our results show the variation of the wave structure within few weeks for the first time. It is found that disappearance of wavy positive peak at longitude 100° in 18 days by the time variation of the wave structure. The wave structure change locally in a short period. The longitudinal difference of the vertical wave propagation is found by observation at some wavelength that observational altitude are different. It is possible that which is different from Rossby wave. It was suggested that not only Rossby wave but also locally and short-period wave structure exist in the polar region. It is cleared that the wave structure at 67° S is only seen at 56° S by the latitudinal variation of the wave structure. Thus, the spatial distribution of the wave structure is constrained.

In addition, the spatial distribution of polar cup haze in the north hemisphere is asymmetry for the north pole. This corresponds with a sharp of auroral oval at some longitude. It is suggested the relationship haze structure and auroral oval.

Keywords: haze, wave structure