Time and wavelength variation of wave structure in Jupiter's south polar region observed with ground-based telescope

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The south polar wave at about 67^o S in Jupiter is considered as one of signatures of Rossby wave. Previous observations, such as by Cassini ISS in 2000 or the Hubble Space Telescope (HST) from 1994 to 1999 [*Barrado-Izagirre at al.,* 2008], show that the polar region is covered by bright diffuse haze and its edge has a wave structure spreading in longitudinal direction with wavenumber of 12-14 at 67^o S, which travels westward with a phase velocity of 0-10 m/s in SystemIII. 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 and less than) is not clear.

Using a deep methane absorption band filter at 889 nm installed at Multi-Spectral Imager (MSI) of the 1.6 m Pirka telescope, we investigated the meridional and vertical wavenumbers and phase velocity of the observed wave structure and zonal wind speed.

In this presentation, we introduce the observational results of time variation of the wave structure at 889 nm in Jupiter's south polar region in 2011 to 2015 by the ground-based telescope. Each result is separated by two weeks to a few months in the periods that we can observe Jupiter. Our results show the wave structure is very different between 2011 and 2015. In 2011, longitude between 0^o and 150^o in SystemIII are also similar, however other longitudes are very different. Large changes in the wave structure of within a few days are observed even in 2015. This point is different from previous studies. Moreover, we compare this structure with the wave structure at a middle methane band filter at 727 and 619 nm. Using another wavelength filter, we can get information of wave structure in troposphere. We can get vertical variation of wave structure between pressure altitude of about 361 mbar and 750 mbar. However, we cannot use the same method which selected images as in the 889 nm. Because the brightness ratio of Jupiter to Galileo satellite used by estimate of atmospheric seeing differ about thirty times between 889 nm and another methane band. We also introduce result of wave structure using new method of selection of Jupiter image which using only brightness of Jupiter itself. This is a new point of my study. Using frequency analysis of latitudinal direction of Jupiter, we can get wave structure by every wavelength.