

Study of Jovian atmosphere dynamics by a multi-band imaging observation

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There are various structures on the surface atmosphere of Jupiter. For example, 'zones' or 'belts' and vortex structures such as great red spot (GRS) are widely known as quasi-permanent features. Many observations from the ground have revealed dynamical variations both in spatial scale and in visual color for these structures. The changes in apparent color of these structures often occur accompanying dynamical processes such as deformation and change in vorticity. Therefore, it would be a key to understanding Jovian atmosphere dynamics to monitor the change in color of surface structures. The objective of this study is to reveal the mechanism of the variations in Jovian surface structures by a ground-based observation with a multi-band imaging system.

We have developed a multi-band imaging system which can simultaneously obtain both spectral data and spatiotemporal variations of structures. Seven bands in visible range have been selected for the routine observation based on the results from previous spectroscopic works. We have determined the relative sensitivity among these bands which is essential to synthesize a precise natural color image from 7 images. In this talk, we report the initial observation results obtained by the system. The results of the validation for these results by comparing with previous spectroscopic studies using Cassini spacecraft and Hubble space telescope are also shown.

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