

Short-term variability of Jupiter's extended sodium nebula

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Ground-based optical observation of D1 and D2 line emissions from Jupiter's, which extends over several hundreds Jovian radii, was carried out at Mt. Haleakala, Maui, Hawaii using a wide-field filter imager in the period of May 19 through June 21, 2007. More abundant ionospheric ions like NaX⁺, which are thought to produce fast neutral sodium atoms due to dissociative recombination process, are expected to exist in Io's dayside hemisphere than in the nightside. When Io's leading hemisphere is illuminated by the Sun, it is also expected that more abundant NaX⁺ ionospheric ions are picked up by Jovian corotating magnetic field, and they will produce more abundant fast sodium atoms. This scenario suggests that such difference of ionospheric causes east-west asymmetry of sodium nebula and its variation with respect to Io's orbital motion in the inner region of the nebula. However, such phenomenon has not been observed clearly yet in the past. It is because the FOV for instruments used in the past observations was too large, and they could not clearly image the inner region of the nebula, while outer nebula is not suited to identify the variation on Io's orbital motion. By using imager with a medium FOV in our observation, we could obtain images of sodium nebula in a region within 50 jovian radii from Jupiter. In our observation at Haleakala, variations of the nebula with respect to Io's orbital motion were clearly identified. However, most of images obtained in our observation are still being analysed, and final results will be given at the presentation.