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Observation of lunar sodium atmosphere using UPI-TVIS onboard KAGUYA (2)

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We measured sodium emission of lunar exosphere from the lunar orbiter SELENE (Kaguya) using UPI-TVIS (Telescope for VISible light in Upper-atmosphere and Plasma Imager component) [Taguchi et al., 2010, Yoshikawa et al., 2007, Yoshikawa et al., 2002, Yamazaki et al., 2002] instruments from December 2008 through June 2009. Variations of line-of-sight intensity measured in night side hemisphere were well expressed as spherical symmetric distributions of sodium exosphere with temperature of 2400-6000 K. During the 6-month period, the sodium density decreased gradually by 20-25% during first and last quarters though we could not see depletion of sodium density caused by passage across the Earth's magnetotail. These results suggest that the supra-thermal components of sodium exosphere are generated by photodesorption and/or micrometeoroid vaporization. The variation of sodium density depending on lunar phase angle is possibly explained by asymmetry source distribution on the surface.

Keywords: moon, sodium, atmosphere