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Imaging of the exospheric sodium tail on Mercury using a Fabry-Perot Interferometer

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Observations of sodium emission from Mercury's atmosphere were carried out using a Fabry-Perot Interferometer at Haleakala Observatory on June 14, 2006. The Fabry-Perot Interferometer was used as a wavelength-tunable filter. The spectra of the surface reflection were subtracted from the observed spectra to obtain the intensity distribution of sodium emission because sodium emission is contaminated by the surface reflection of Mercury. The image obtained in the observation clearly shows the sodium exosphere extended to the anti-solar direction. The lifetime of sodium atoms was estimated to be 9.8-11 $\times$ 10^3 sec using the observed e-folding distance (5.0 $\times$ 10^4 km) in the sodium tail and was lower than observed by Potter et al (2002). However, it is close to the value predicted by Huebner et al. (1992).