

水星ナトリウム大気分光カメラ MSASI フライトモデルの性能試験

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Test results of the flight model of Mercury Sodium Atmosphere Spectral Imager onboard BepiColombo/MMO

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Mercury's exospheric sodium has been most investigated in exospheric species to clarify the dynamics and source process of surface-bounded exosphere because its emission is so bright that it can be detected using a ground-based telescope. Since its discovery, a lot of ground-based observations for more than two decades have been done and MESSENGER succeeded in its orbit insertion in March 18, 2011, however, the source process of sodium is yet unclear.

The Mercury Sodium Atmosphere Spectral Imager (MSASI) is a high-spectral, high-temporal resolution, and wide-FOV imager for exospheric sodium emission. The spectral resolution is $\sim 80,000$ and it enables us to distinguish the sodium emission line from bright surface reflection of Mercury and to observe dayside exosphere. The temporal resolution is 2 ms, which enables to achieve the spatial resolution of 1.25 km on the Mercury Magnetospheric Orbiter, which is a spin stabilized spacecraft. To achieve high temporal resolution, a high speed CMOS image sensor and an image intensifier are used in the detector unit which was assembled in Japan. To achieve high spectral resolution, a Fabry-Perot etalon and a temperature-stable narrow band filter are used in the optics which is assembled in UK. To achieve wide FOV, a moving mirror unit was assembled in Russia.

We have already assembled whole the instrument and plan to finish all the performance and environmental test by Oct 2012. In this presentation, we report final status of the development of MSASI.