Development of Mercury's Sodium Atmosphere Spectral Imager using Fabry-Perot Interferometer

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It turns out by the ground-based observation in 1985(Potter and Morgan) that the main component of Mercury's atmosphere is sodium, and various theoretical models have been advocated about generation and loss process of the Mercury sodium atmosphere, but it is too difficult to observe the atmospheric distribution continuously in ground-based observation. On the other hand, Mercury orbiting satellite can do it, but observation of sodium D line with thin line width is also difficult.

We designed Mercury Sodium Atmosphere Spectral Imager using Fabry-Perot Interferometer which has high wavelength resolution and put it to the test. The resolution of this FPI-based spectral imager is 25 miliangstrom which is half of Mercury sodium D2 line width.

It is needed for the resolution of 25 miliangstrom to fabricate Fabry Perot Etalon with nanometer order accuracy. We fabricated Fabry Perot Interferometer using Zerodur as spacers and check its spectral performance and heat tolerance.