



GOSAT-2: Development Status of the mission instruments

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Over five years operational periods of GOSAT, the useful scientific data sets and interesting articles for carbon source/sink evaluation were produced and published. On the other hand, although the greenhouse gases measurement data are expected to contribute to the efforts to address global warming, the accuracy of GOSAT data is not enough for the political use.

Through the GOSAT operation, we had learned a lot of things on the instrument, software, processing algorithm and operation; what should be improved in the following mission. To elucidate the carbon cycle more precisely, our experiences regarding observation performances as well as hardware design were summarized and reflected on the mission requirements on GOSAT-2 which is for a good understanding of CO₂ and CH₄ sources and sinks and the underlying carbon cycle was defined.

Based on the mission requirements, the hardware system requirements were defined and the design was started.

Recently we had completed the preliminary design and shifted to the critical design phase, that is the phase C.

In the preliminary design phase, the design of the TANSO-FTS-2 which is the primary mission instrument had been almost fixed as well as the one of the TANSO-CAI-2 which is the secondary mission instrument.

The results of the preliminary design of GOSAT-2 meet all of the requirements set by the mission requirements. To improve the measurement accuracy, the signal to noise ratio will be increased by the extension of the aperture size from 64mm to 73mm and cooling the after optics as well as the thermal detectors. And to increase the number of the useful data, GOSAT-2 will equip the function to avoid the clouds during the observation using the images obtained by the monitor camera in FTS.

To observe the carbon monoxide, the 2.3 [U+F06D] m observation channel will be added. This function will be realized by the extension of the 2.0 [U+F06D] m observation band to 2.3 [U+F06D] m.

The pointing angle in the along track direction will be extend from 20 degrees of GOSAT to 40 degrees to expand the observation area over the ocean where the sun glint is observed. This will make it possible to increase the number of the observation points over the ocean and contribute to the global observation including the ocean.

The data of the TANSO-CAI on GOSAT has been used to eliminate the data contaminated by the clouds and compensate TANSO-FTS data for the influences of the aerosols. But the performance of the TANSO-CAI-2 on GOSAT-2 will be improved to enforce the aerosols observation ability to detect the PM_{2.5} by the increasing the observation bands number including the around 340nm wavelength.

In this presentation, the results of the preliminary design of the mission instruments of GOSAT-2 will be presented.