

## Preliminary sensitivity study of the GOSAT-2 FTS SWIR retrievals based on the designed specifications

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### 1.NIES

The Greenhouse gases Observing SATellite (GOSAT) was launched in January 2009 and observed global distribution of the column-averaged dry air mole fractions of carbon dioxide and methane ( $\text{XCO}_2$  and  $\text{XCH}_4$ ) for about seven years. As a successor mission to the GOSAT, GOSAT-2 is planned to be launched in early 2018, and its critical design review (CDR) was completed. GOSAT-2 also has a Fourier transform spectrometer (FTS) like GOSAT to obtain short-wavelength infrared (SWIR) light reflected from the earth's surface and thermal infrared (TIR) radiation emitted from the ground and atmosphere. According to the current design of the FTS-2 (FTS onboard the GOSAT-2), its SNR is higher than or almost equal to that onboard the GOSAT, and it covers the 2.3  $\mu\text{m}$  carbon monoxide (CO) band as well as the 1.6 and 2.0  $\mu\text{m}$   $\text{CO}_2$  bands and 1.67  $\mu\text{m}$   $\text{CH}_4$  band. Our preliminary sensitivity test shows that the SNR improvement in SWIR bands reduces the retrieval random error (precision) about 15% for  $\text{XCO}_2$  and 35% for  $\text{XCH}_4$  than those of GOSAT.

Keywords: GOSAT-2,  $\text{XCO}_2$ ,  $\text{XCH}_4$