

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

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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 (X_{CO_2} and X_{CH_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 μm carbon monoxide (CO) band as well as the 1.6 and 2.0 μm CO_2 bands and 1.67 μm CH_4 band. Our preliminary sensitivity test shows that the SNR improvement in SWIR bands reduces the retrieval random error (precision) about 15% for X_{CO_2} and 35% for X_{CH_4} than those of GOSAT.

Keywords: GOSAT-2, X_{CO_2} , X_{CH_4}