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GOSAT three-years operation on orbit and updated Level-1 processing

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To monitor the global column concentration of carbon dioxide (CO_2) and methane (CH4) from space, the Greenhouse gases Observing SATellite (GOSAT) was launched on January 23, 2009, and has started the operational observation. Thermal and Near Infrared Sensor for Carbon Observation– Fourier Transform Spectrometer (TANSO-FTS) has been continuously measuring CO_2 and CH4 distributions globally every three days, and data distribution to the public started from Feb. 16, 2010. During three years operational periods, the radiometric, geometric and spectroscopic characterizations of TANSO have been continuously conducted with updating the Level-1 processing algorithm. To make a precise spectroscopic observation, correction algorithms were newly developed, demonstrated and installed on operational processing. Two major corrections are discussed. One is a correction of the scan-speed instability caused by micro-vibration from satellite. Through the on-orbit data analysis, degrading spectroscopic accuracy caused by periodically micro-vibrations was found, and these distortion effects were compensated with applying the re-sampling technique for interferogram. The other is non-linearity correction in the electronics. The main course of non-linearity is electronic filters on band 1 signal chain. The zero-level offset is slightly changed with input signal levels. To compensate the non-linear effect, the additional correction schemes are approved from recent version of Level-1 processing. In this presentation, the detail of on-orbit characteristics, processing algorithm of Level-1 and the current status of TANSO will be discussed.