

XCO₂ retrieval results from Tansat over Dunhuang

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TanSat is the first Chinese satellite to monitor the carbon dioxide (CO₂) and the methane (CH₄) globally from space. The TanSat satellite flies in a sun-synchronous orbit at 13:30 local time, with a revisit period shorter than 16 days; the deviation of the equator crossing time shall be shorter than 15 minutes during 3 years. It has been launched on December 22, 2016. Two instruments consist of a high-resolution Carbon Dioxide Spectrometer for measuring the near-infrared absorption by CO₂ and CAPI (Cloud and Aerosol Polarimetry Imager) to compensate the CO₂ measurement errors by high-resolution measurement of cloud and aerosol are accommodated on TanSat. In order to fulfill the need of TanSat orbit test, a comprehensive ground experiments was conducted in Dunhuang calibration field during April, 2017. Target mode of TanSat is used to cooperate with the ground experiments. DOAS algorithm is used to process the TanSat spectrum in weak CO₂ absorption band to retrieval XCO₂. The retrieval results are compared with ground measurements. Good spectrum fits and less than 1% bias from ground measurements show the good ability of TanSat in monitoring the greenhouse gas.