

衛星と直接観測データを用いたメガシティからのCO₂発生量のインバース解析 Inverse analysis of CO₂ emissions from a mega-sized city using satellite and in situ observation data

今須 良一^{1*}, 新井豊¹, 近藤裕昭², 丹羽洋介³, 澤庸介³, 松枝秀和³, 町田敏暢⁴, 横田達也⁴

Ryoichi Imasu^{1*}, ARAI, Yutaka¹, KONDO, Hiroaki², NIWA, Yosuke³, SAWA, Yousuke³, MATSUEDA, Hidekazu³, MACHIDA, Toshinobu⁴, YOKOTA, Tatsuya⁴

¹ 東京大学大気海洋研究所, ² 産業技術総合研究所, ³ 気象庁気象研究所, ⁴ 国立環境研究所

¹ Atmosphere and Ocean Research Institute, The University of Tokyo, ² National Institute of Advanced Industrial Science and Technology, ³ Meteorological Research Institute, Japan Meteorological Agency, ⁴ National Institute for Environmental Studies

The greenhouse gas observing satellite (GOSAT) has functioned normally for more than four years since its launch on 23 January 2009. Although its main purpose is the measurement of greenhouse gases globally to reduce the estimation error of source/sink strength in a sub-continental size region, it can measure gas concentrations at multiple targets on a regional scale during one orbital over-flight. We have initiated and conducted special observations to monitor CO₂ concentrations at sufficiently numerous observation sites and thereby cover all regions of a mega-sized city. The main sensor of the satellite, the "thermal and near infrared sensor for carbon observation Fourier transform spectrometer (TANSO-FTS)", has been operated in a "specific operation mode" to measure CO₂ concentrations at 4 x 4 (totally 16) mesh points over the Kanto Plain, the center of which is Tokyo. This specific observation covers about 100 km x 100 km of the plain. These satellite data are used as inputs as well as ground-based and aircraft observation (CONTRAIL) data for the inverse analysis of emission/sink strength of CO₂. The AIST meso-scale transport model (AIST-MM), whose highest spatial resolution is 1 km is used for the inverse analysis. Boundary conditions in a large area outside the regional target are provided by the NICAM based transport model (NICAM-TM). The system detected a signal of reduction of CO₂ emission from some industrial districts just after the Tohoku-Pacific Ocean Earthquake.

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