



## **Interannual variability of the regional CO<sub>2</sub> and CH<sub>4</sub> fluxes estimated with GOSAT observations**

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GOSAT Level 4 products – monthly regional surface flux estimates by inverse modeling from CO<sub>2</sub> and CH<sub>4</sub> GOSAT column-averaged mixing ratios and ground-based observational data using a global atmospheric transport model - have been updated recently to cover the 2-year period starting June 2009. This temporal extension provides look at the interannual flux variability including events of CO<sub>2</sub> and CH<sub>4</sub> emissions from a large-scale climate anomaly and resultant forest fires in Russia in 2010. Higher emissions of CO<sub>2</sub> and CH<sub>4</sub> in western Russia in the summer of 2010 are estimated when GOSAT observations are also included in the inverse modeling compared to just using ground-based data. The estimated summer emissions in 2010 are also higher than in the same season of the adjacent years. GOSAT compliments the ground-based networks by observing the concentration response to emissions closer to fire locations, resulting in the inverse models identifying emission regions more accurately. Elsewhere, GOSAT-aided flux estimates point to higher CH<sub>4</sub> emissions (compared to ground-based only estimates) in the remote sub-tropical regions of the South America, Africa and South-East Asia. Higher emissions over South America can be attributed to biomass burning and anthropogenic sources, while in South-East Asia those are likely to be caused by agriculture and natural ecosystems.