[EE] Evening Poster | A (Atmospheric and Hydrospheric Sciences) | A-CG Complex & General

[A-CG35]Global Carbon Cycle Observation and Analysis

convener:Kazuhito Ichii(Chiba University), Prabir Patra(Research Institute for Global Change, JAMSTEC), Toshinobu Machida(国立環境研究所, 共同), David Crisp(Jet Propulsion Laboratory)

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The Paris Agreement under the United Nations Framework Convention on Climate Change (UNFCCC) is a landmark agreement in the 21st Conference of the Parties (COP21) in December 2016, which aims at reduction of greenhouse gases (GHGs) emission for keeping the global warming below 2 degC. The national commitments and progresses should be carefully monitored and verified by international bodies.

In recent years, the number of observational platforms for monitoring atmospheric GHGs and air pollution species is increasing. National or regional emission inventories have also been prepared at greater resolution in space and time using different methodologies. However, due to uncertainties in modeling and sparse observation network, high uncertainty persists in global and regional sources/sinks estimations, particularly for CO2.

Developing integrated observation and analysis systems for GHGs are the most urgent tasks. Atmospheric transport models, inverse models, and process-based bottom-up models should be tested and improved. The "top-down" (with inverse models) and "bottom-up" (with surface flux/emission network data and ground-based models) estimations have to be reconciled for gaining confidence in verifying the national commitments.

The purpose of the session is to discuss state-of-the-art techniques for estimations of surface budget of GHGs and air pollutants. Ideally, these results would allow us to detect changes at an early stage under the changing climate and human activity, and to disseminate scientific knowledge for mitigation policies in a timely manner. Improved estimates of emissions from land use change, forest fires, and other anthropogenic sources (urban developments and thermal power station etc.) should be addressed. We also welcome discussions for designs and plans for future studies targeting city and country scale emission estimations using sophisticated modeling tools.

[ACG35-P04]Global carbon cycle estimates in GOSAT/GOSAT-2 projects

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Greenhouse gases Observing SATellite (GOSAT) has been monitoring atmospheric column carbon dioxide (XCO_2) and methane (XCH_4) concentrations from space since its launch in January 2009. The primary goal of GOSAT project is to successfully estimate global carbon budget on subcontinental scales using spatiotemporal distribution of XCO_2 and XCH_4. GOSAT observations have provided the basis for assessments of the values of space-based measurements of CO_2 and CH_4 concentrations. Additionally, GOSAT-2 which is the successor of GOSAT is scheduled for launch in the end of 2018. GOSAT-2 aims to monitor spatiotemporal distribution of greenhouse gases with higher level of accuracy and to improve the number of available observation data. This work summarizes GOSAT level 4 products on global CO_2 and CH_4 flux estimates based on an inversion system and the benefit of GOSAT observations for the

study of global carbon cycle. We also introduce a new inversion system which is under construction as GOSAT-2 level 4 system; atmospheric transport and inverse models, a biospheric model using variability of solar-induced chlorophyll fluorescence by GOSAT observations, and a high resolution bottom-up anthropogenic emission inventory.