

Establishment of MRV system of greenhouse gas emission from Asian rice paddies by integrating multi-type satellite data and ground flux data

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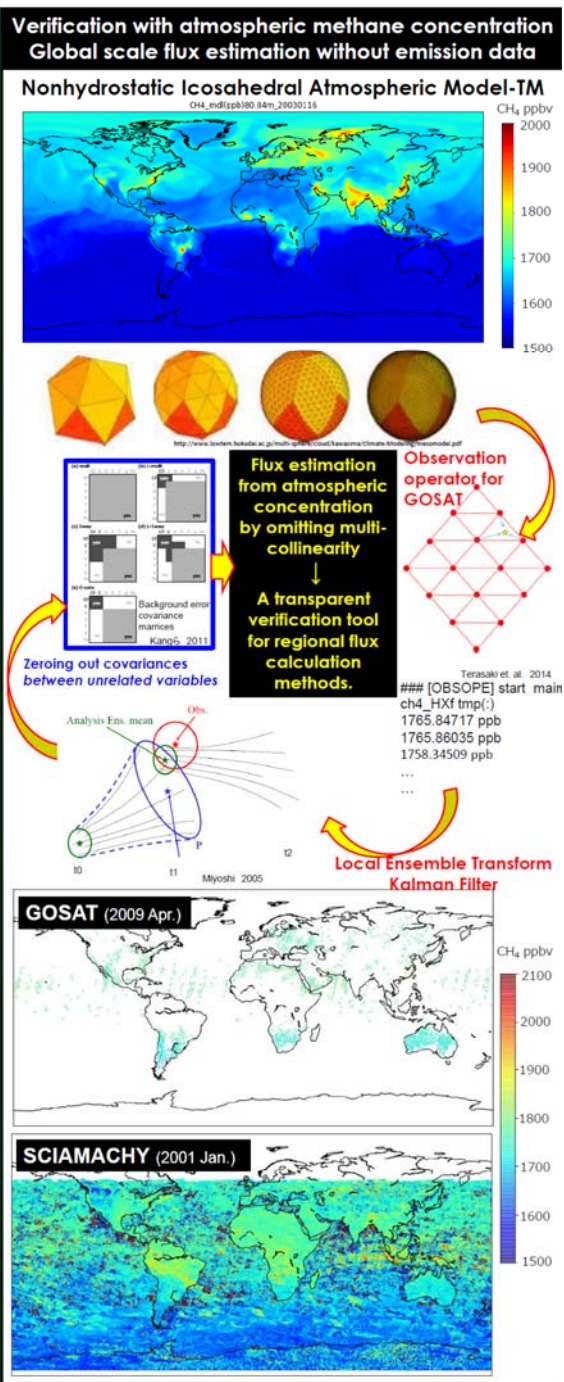
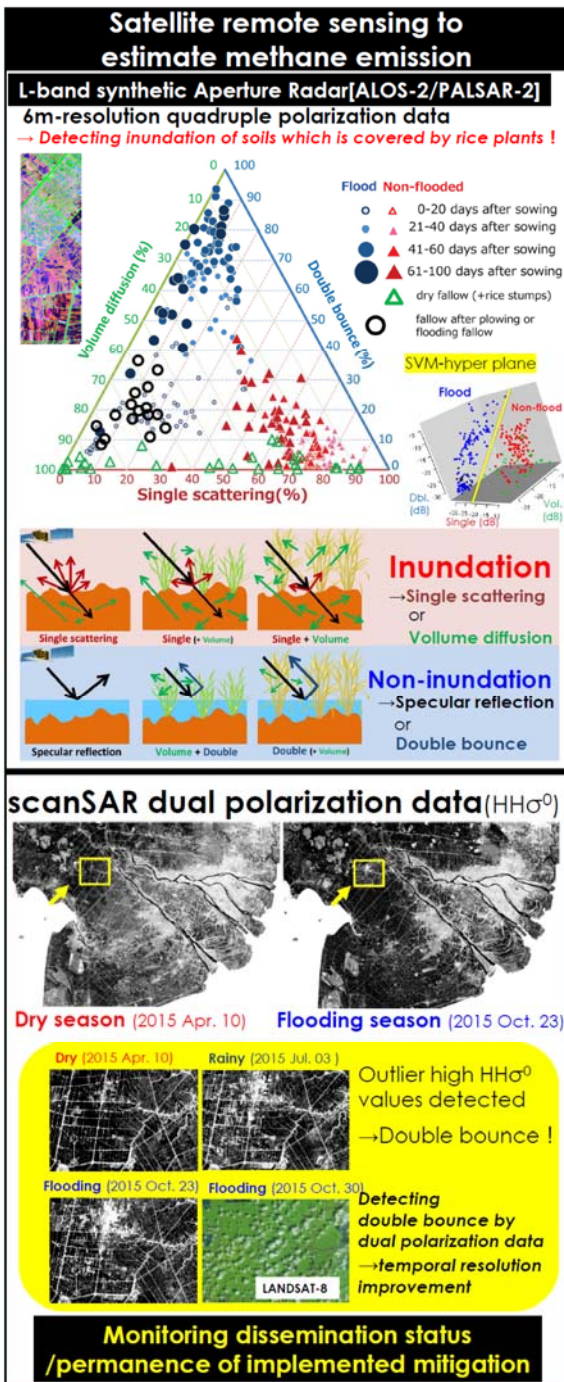
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Abstract

Greenhouse gas (GHG) emission observation/reduction technologies are attracting greater deal of attention from policy makers to achieve Sustainable Development Goals. In terms of GHG accounting, Monitoring, Reporting and Verification (MRV) systems have become significantly important for the countries which ratified Paris Agreement by promising Intended Nationally Determined Contributions (INDC). Not only evaluation of the amount of GHG emitted from the countries, but also the mitigation's effect and its dissemination status need to be monitored by the policy makers. In this regard, the societies require the MRV systems with transparency and high cost-performance.

To address such concern, the authors are building an efficient/transparent MRV system in a tropical rice cropping system based on satellite remote sensing data. We are developing a long-term consistent bottom-up approaching method with high spatio-temporal resolution, based on the Japanese earth observation technology (e.g., ALOS-2, AMSR-E/2, GCOM-C). In order to validate the outputs from the bottom-up approaching method, Now we are also challenging to build an independent top-down approaching method based on the other satellites data (GOSAT,SCIAMACHY,AIRS) using NICAM-LETKF with 1way-multivariate variable localization, which can estimate the surface fluxes without requiring any direct observation or a-priori information of the fluxes with K-computer. In this presentation, we would like to discuss the development plan and expected integration with further cross-disciplinary studies.



Japanese satellite based methane emission status evaluation methods. Left figure presents bottoming up approach method with ALOS-2 evaluating soil inundation status which controls methane emission. Right figure shows the top down approach method with GOSAT and NICAM-TM-LETKF using K computer.