Methane Concentrations Over Monsoon Asia Observed from Space: Comparison with Model Simulation

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Hayashida et al., [2013] had reporteddetailed analysis of the column-averaged CH₄ concentration (xCH₄) over the Monsoon Asia using scanning imaging absorption spectrometer for atmospheric chartography (SCIAMACHY) and compared the data with the bottom-up emission inventory datasets and other satellite-derived indices such as the land-surface water coverage (LSWC) and the normalized difference vegetation index (NDVI). We found the geographical distribution of high xCH₄ values corresponds to strong emissions from regions where rice is cultivated, as indicated in the inventory maps. This analysis suggests that the emission of CH4 from rice cultivation mainly controls the seasonality of the CH₄ concentration over most of the Monsoon Asia. We extend the analysis of CH₄ concentration to Greenhouse gases Observing SATellite (GOSAT), which was launched on 23 January 2009 to monitor the global distributions of CO₂ and CH₄ from space. The spatiotemporal variation of xCH₄ observed by GOSAT is almost consistent with that obtained by SCIAMACHY. However, it is difficult to interpret observed variation in the column-averaged CH₄ concentration, as it has no information on vertical distribution. In this study, we examine the GOSAT data with support of model simulation using NICAM-TM and other satellite data to understand CH₄ behaviour over Monsoon Asia.

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References

Hayashida et al., Remote Sensing of Environment 139 (2013) 246-256