



## **Constraining Amazonian Methane Emission from Wetlands**

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The Amazon Basin contains large wetland ecosystems which are important sources of methane (CH<sub>4</sub>). Spaceborne observations provide detailed information about the spatio-temporal distributions of atmospheric methane over the Amazon Basin which will provide a strong constrain on the underlying emissions and their year to year variations.

Methane observations from space are available from the Japanese GOSAT instrument since 2009. We use the proxy retrieval method which provides much greater coverage over the Amazon region compared to so-called Full-Physics methods due to their lower sensitivity to thin clouds. Validation of GOSAT retrieval over the Amazon using the ground-based TCCON network is currently not possible due to a lack of data and we have used routine aircraft profiles to show that GOSAT columns are sufficiently accurate for estimating surface flux for the region. Using a variational flux inverse system together with the 3-D atmospheric chemical transport model TOMCAT, we infer surface fluxes for the Amazon region from GOSAT observations which are used to analyse the spatial distribution of methane wetlands emissions as well as annual variations in emissions with a focus on periods 2011/2012 and 2013/14 which are characterized by large variations in rainfall.