



The global distribution of Methane: A global Atmospheric Chemistry (EMAC) model virtual replication of CARIBIC-flight sampling

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The global distribution of methane (CH_4) is defined by various natural and anthropogenic sources, by soil uptake, and by chemical decay – predominantly - with the OH radical. Because of its high global warming potential methane increasingly deserves attention by atmospheric researchers and is subject of various monitoring and numerical modeling investigations, especially with the aim to quantify the sources.

During about 400 intercontinental flights on-board a Lufthansa Airbus A340-600 passenger aircraft from 2005 till now air-samples were taken in a fully automated instrument container and analysed after landing with respect to various atmospheric trace constituents - methane one of them. With increasing geographical and temporal coverage these observations provide a useful database for the understanding of the global methane budget.

Based on recent assessments methane emissions from burning, rice, soils, termites, bogs, swamps, coal, oil, gas, animals, and landfills in this study have been quantified and applied for global ECHAM5/MESy Atmospheric Chemistry (EMAC) model input.

As a result calculated CH_4 mixing ratios are compared to measurements along the CARIBIC flight tracks.