Geophysical Research Abstracts,
Vol. 11, EGU2009-1044, 2009
EGU General Assembly 2009

Potential production of nitrous oxide by archaea in the eastern Tropical North Atlantic Ocean

C. Loescher (1), A. Kock (2), H. Bange (2), and J. LaRoche (2)

(1) (cloescher@ifm-geomar.de), Institut für allgemeine Mikrobiologie, Universität Kiel, Kiel, Germany, (2) IfM-Geomar, Kiel, Germany

The greenhouse gas nitrous oxide (N_2O) is mainly produced by the processes of nitrification and denitrification. In order to identify the major formation pathway in the eastern tropical North Atlantic Ocean, measurements of dissolved nitrous oxide along vertical profiles were made during a cruise in February 2007. Identification of possible producing organsims took place by DNA and RNA analysis. The present oxygen concentrations, as well as the absence of transcripts of the denitrification key genes nirS/K and nosZ indicate, that N_2O formation did not take place via denitrification. However, a positive correlation of N_2O with nitrate, as well as excess N_2O with the apparent oxygen utilization, suggest that nitrification is the major formation pathway in the study area. Detection of amoA, the key gene for the oxidation of ammonia approved this observation. It was found, that transcripts of amoA deriving from archaea were found throughout the water column, whereas transcripts of bacterial amoA could not be detected. Therefore, a production of N_2O via archaeal nitrification is suggested.