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Hydrogen in the Atlantic Ocean

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Although hydrogen (H2) is considered as one of the most important future energy carriers, little is known about the global biogeochemical cycle of this trace gas (Rhee et al. 2006). In order to assess the potential impact of expected increasing H2 concentrations to the atmosphere a fundamental understanding of the global H2 cycle is indispensable (Tromp et al. 2003, Warwick et al. 2004).
Oceans are one source of atmospheric H2, produced by biological processes such as fermentation and N2-fixation and abiotic photochemical processes (Punshon and Moore 2008 and references herein). Further information can be obtained by studying the isotope composition of H2. However, the isotopic ratio of oceanic released H2 is unknown and has so far only been estimated from thermodynamic equilibrium.
We investigated the atmospheric D/H isotopic ratio of H2 in the Atlantic Ocean. First results of atmospheric H2 isotope ratios from the West African coast of Mauritania and from a meridional transect over the Atlantic Ocean will be presented. Samples were taken onboard the German research vessel “Poseidon” in February 2007 associated to SOPRAN and during the cruise Ant XXIV-4 with the German research vessel “Polarstern” in April 2008 between Punta Arenas (Chile) and Bremerhaven (Germany).

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