



EUROHYDROS – a European Network for Atmospheric Hydrogen Observations and Studies

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The proposed global use of molecular Hydrogen (H_2) as an energy carrier demands an improved understanding of the atmospheric H_2 budget. Changes in the H_2 budget might effect the oxidation capacity of the atmosphere (reaction with OH) and the water vapour levels in the stratosphere (with a feedback on ozone). However, so far only a limited number of consistent, high quality H_2 measurements have been performed. Thus, little is known about the H_2 budget of the atmosphere and the relevance of its changes for our climate.

During the first year of the EU Project EUROHYDROS – a European Network for Atmospheric Hydrogen observations and studies – a monitoring network for H_2 including 11 European continuous and 20 globally distributed flask measurements sites has been established. All measurements within this network refer to a consistent and quality-controlled calibration scale for H_2 . For some of the sites, the isotopic composition of molecular hydrogen is also determined. Besides H_2 , carbon monoxide (CO), as an indicator for combustion processes and anthropogenic emissions and ^{222}Rn as a proxy for the boundary layer height are measured at most of the sampling sites.

Sinks and sources of H_2 are examined in diurnal studies, soil uptake experiments and using mechanistical studies. Biomass burning and combustion sources are studied and

isotopic signatures of source and sink processes are determined.

A multi-scale model hierarchy is used to model H₂ and its isotopic composition on global and regional scales, derive sources and sinks, assess trends and seasonal variability including the troposphere and stratosphere. The models will be constrained by the atmospheric observations. This enables the improvement of our understanding of the H₂ budget and the impact of an anthropogenically changed budget on climate and the ozone layer.