



## **Modeling global H<sub>2</sub> and its stable isotope HD with the global TM5 model using a new condensed photochemical oxidation scheme for deuterated methane and VOC's**

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A new condensed scheme that describes the oxidation of deuterated methane and Volatile Organic Compounds (VOC's) was implemented in the global TM5 model. Together with the new chemistry scheme, the TM5 model was extended with a hydrogen deposition parameterization dependent on biome type and soil moisture content. Finally, a dataset obtained from the project for Global and regional Earth-system Monitoring using Satellite and in-situ data (GEMS) was used for provision of the global sources of molecular hydrogen. The known literature values for the isotopic signatures were attributed to the different source categories. First, the condensed scheme was tested qualitatively in a global simulation of the isotopic composition of molecular hydrogen in the troposphere. Then, the first model results were compared with measurements of the seasonal isotopic variability over the Atlantic meridian and West-to-East European transect. These measurements were obtained using online Isotope Ratio Mass Spectrometry combined with a novel technique to separate hydrogen from the main constituents of air, recently developed by Rhee et al., 2003. The results of the comparison are promising but illustrate the need for future research on the contribution of the oxidation of deuterated VOC's and atmospheric deposition to the global molecular hydrogen budget.