



Estimation of the Hydrogen local traffic source and soil uptake using atmospheric in-situ measurements at Gif-sur-Yvette (Paris region)

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Molecular Hydrogen (H₂) is one of the most abundant trace gases in the atmosphere with a mean ratio of 530 ppb. Its possible use in the future energy chain would increase its mixing ratio through leakage and influence the lifetime and mixing ratio of some greenhouse gases such as methane. However uncertainties on its budget are still large. A better understanding of the hydrogen cycle and of its budget is then essential to provide a better estimation of its impact on other trace gases.

In 2006, a new gas chromatograph with reduction gas detector (PP1, Peak Laboratories, LLC, California, USA) was optimized to measure H₂ and CO, and coupled with an Agilent gas chromatograph, which already measures CO₂, CH₄, N₂O and SF₆ in the frame of RAMCES greenhouse gases monitoring network at LSCE. Since June 2006 semi-continuous measurements of tropospheric molecular hydrogen have been performed at Gif-sur-Yvette, a suburban sampling site in France, 25 km south west of Paris.

Here we present data analysis of nearly 3 years in-situ measurements at Gif-sur-Yvette. From these data we have estimated the local traffic source and soil sink. The traffic source is calculated from the H₂/CO ratio during typical situation with strong correlation and large concentration variation. The soil uptake is calculated using the radon-tracer method during night time inversions with anti-correlation of H₂ and Radon.