

Isotopic analysis of liquid water and vapour with cavity ring-down spectroscopy

Céline Lett, Markus Schmidt, Ulli Seibt, Philippe Biron, Patricia Richard, Kadmiel Maseyk, Thierry Bariac

Bioemco, UPMC-INRA-CNRS, UMR 7618 BioEMCo, Campus AgroParisTech, Bâtiment EGER, 78850 Thiverval-Grignon, France

A Cavity Ring-Down Spectroscopy instrument (CRDS, L1102-i, Picarro, Sunnyvale, CA, USA) was used to measure the isotopic composition of water vapour and of liquid water samples vapourised by instrument's external vaporizer. The presented results show that the isotopic composition of liquid samples ($\delta^{18}\text{O}$ and δD) analysed by the CRDS laser depended on the vapour concentration. The slope of the concentration dependence changed with the isotopic composition of the injected water. A similar dependence was also observed for vapour samples. Direct vapour measurements from the CRDS system agreed well with results from cold-trapped vapour analysed with mass spectroscopy and CRDS systems.