



Water evaporation characterization by its isotopic signature in controlled conditions

Philippe Biron (1), Patricia Richard (1), Frederick Delay (2), Philippe Ackerer (2), Jean-Louis Durand (3), and Thierry Bariac (1)

(1) IEES-PARIS, UMR 7618 (CNRS-UPMC-INRA-IRD-UPEC-Univ. Paris Diderot), Paris, France (philippe.biron@inra.fr),
(2) LHYGES, UMR 7517 CNRS, EOST / Université de Strasbourg, France, (3) Unité de Recherche Pluridisciplinaire Prairies et Plantes Fourragères, INRA, Lusignan, France

Water balance closure remains a critical problem in studies of the continental hydrological cycle. This is especially emphasized regarding the various components of evapotranspiration, that are difficult to measure all the more they concern evaporation fluxes from open water bodies. The natural isotopic tracing of water is increasingly used to better understand the water balance and to measure the signatures of the different vapour sources. However, this approach needs for a sharp characterization of the source signatures and of the products in the vapour-liquid exchanges. Therefore, it is necessary to determine the isotopic composition of the vapour from open water reservoirs before it exchanges and mixes its own components with the ambient atmosphere. In our work, we conducted the characterization of water vapour above open water tanks for different experiments under controlled conditions in a biogeochemical reactor, the aim being to validate an isotopic evaporation-condensation model coupled with mass balance equations. This work should be further extended to the other components of the evapotranspiration flux as the soil evaporation and plant transpiration.