Water isotopologues in the IPSL OGCM

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Seawater isotopologues (δD_{sw} and $\delta^{18}O_{sw}$) have been inplemented in the IPSL ocean general circulation model (OPA/NEMO). Here we analyze the seasonal and regional relationships between δ_{sw} and salinity as obtained from uncoupled and off-line experiments in which the off-line tracer model NEMO is forced with present-day circulation from OPA.

Boundary conditions at the ocean-atmosphere interface are provided by fluxes predicted by an atmospheric GCM with a comprehensive representation of water isotopes (LMDZ-iso GCM; Risi et al.,2010). They consist of climatological gross fluxes of evaporation, precipitation and run-off together with their isotopic composition corresponding to the year 2006 A.D.

The water fluxes of LMDZ and OPA are not strictly identical. Hence a δ_{sw} computed with LMDZ outputs is not consistent with the salinity computed directly with OPA. For consistency reasons, we compute an "artificial salinity" (Delaygue et al., 2000; roche et al., 2004) with the water fuxes from LMDZ. This additional passive tracer has no effect on the ocean dynamics and its sole purpose is to allow for a coherent assessment of model results against available climatologies (e.g., LeGrande and Schmidt, 2006).

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