



The distribution of water stable isotopes simulated in the present-day climate by the LMDZ GCM

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The stable isotopic composition of precipitation or water vapor is a valuable tool to study past climates or to constrain past or present water cycle. Isotopic modeling in atmospheric general circulation models (GCMs) is a promising mean to investigate what controls isotopic distributions. Water stable isotopes (H_2O^{18} , H_2O^{17} and HDO) have been introduced into the GCM developed by the Laboratoire de Météorologie Dynamique (LMDZ4), which constitutes the atmospheric component of the IPSL coupled model that participates in IPCC coordinated simulations. A particularity of this GCM is that it includes the convective parametrization originally developed by Kerry Emanuel (MIT) and further developed by Jean-Yves Grandpeix (LMD). This parametrization represents in detail some microphysical processes such as rain reevaporation, which is an important part of the water cycle in convective regions and strongly affects the isotopic composition of both precipitation and water vapor. An evaluation against GNIP (Global Network of Isotopes in Precipitation) data of the global distribution of the isotopic composition of precipitation simulated by the model will be presented, and the main controls of the isotopic composition of precipitation and water vapor will be analyzed, with a focus on the tropics.