

Title: A water isotopologue scheme for the cloud resolving model MesoNH
Author: Jean-Pierre Pinty

The cloud resolving-mesoscale model MesoNH is a 3D non-hydrostatic model developed at Lab. d'Aerologie and Meteo-France in Toulouse. It is able to simulate the water cycle of deep convective clouds in idealized or real meteorological frameworks. The code is based on advanced numerical transport schemes and contains many parameterizations with a special emphasis on the 3D turbulence and 2-moment cloud microphysical schemes, useful at high resolution. A new starting project (work is underway) is to implement a water isotopologue scheme based on the microphysical description of mixed-phase clouds in the model. The scheme includes an accurate formulation of the isotopic segregation process during vapor-liquid and vapor-ice exchanges, and the transfer of the water isotopologues accompanying the microphysical evolution of the condensate (here 2 liquid and 3 ice species) by collection growth, riming, melting, etc. inside the cloud. According to the degree of achievement of the scheme, the isotopic budget of a 2D tropical squall line will be presented.