Geophysical Research Abstracts
Vol. 15, EGU2013-13163, 2013
EGU General Assembly 2013

Towards a coherent framework for evaluating Lagrangian evaporative moisture source diagnostics

Harald Sodemann
Institute for Atmospheric and Climate Science, ETH Zürich, Switzerland (harald.sodemann@env.ethz.ch)

Identifying the evaporative sources of atmospheric water vapor is an important research theme, for instance in understanding precipitation extremes. However, moisture origin is not a quantity that is readily observable in nature. While stable water isotopes can provide useful hits in some cases, their interpretation is often complicated by the fact that they represent the integrated evaporation and condensation history of atmospheric water vapour and by atmospheric mixing processes. Moisture diagnostics are thus a crucial tool to access this information. In this work, the main assumptions made in commonly applied Lagrangian moisture source diagnostics are singled out, and ways to improve the basis of these assumptions are proposed. The main focus in this respect is thereby on testing the well-mixed assumption of the lower troposphere required for several diagnostics. Further aspects concern how representative the information from different diagnostics is for the total precipitation in a study area. An Eulerian simulation with artificial water source tracers is thereby applied as a common testbed and provides the benchmark for all tested diagnostics.