Geophysical Research Abstracts
Vol. 13, EGU2011-8841-1, 2011
EGU General Assembly 2011

Isotopic Composition of Rainwater in Subtropical Region, Tenerife, Canary Islands

Elisa Sosa Trujillo, Juan Carlos Guerra García, and María Teresa Arencibia Pérez
Hydrometeorology Research Group, La Laguna University(Spain)

The subtropical region on Canary Islands is a zone with a crucial importance to understand dynamics and thermodynamic atmospheric due to its coincidence in latitude with the descending branch Hadley's cell. Therefore is a very sensitive zone to climate changes, which turns it into an ideal emplacement for the study of such changes. An overall research on stable hydrogen and oxygen isotopes in precipitation over Canary Islands could contribute to a better understanding of the global hydrological cycle and its variations associated with climate changes.

The first results of the stable isotope measurements carried out on single precipitation events in a weather station located in La Laguna, Tenerife, Canary Islands, are presented. During the year 2007 to 2009, individual precipitation samples have been collected and analyzed for the composition of δ^{18}O and δ^{2}H, within the Global Network for Isotopes in Precipitation (GNIP) project. This three-year study investigates the relative influence of meteorological variables (precipitation amount, surface and cloud base temperature), air mass history, and moisture source region on precipitation oxygen (δ^{18}O) and hydrogen (δ^{2}H) isotopes on event timescales.

Based on the three years monitoring (42 events of precipitation), the weighted mean isotope values of the precipitation were -5.1‰ for oxygen and -26.3‰ for hydrogen, ranged from 6.8‰ to -57.8‰ for δD and from -1.4‰ to -9.3‰ for δ^{18}O. The local meteoric water line (LMWL) δ^{2}H= 7.6·δ^{18}O + 13.7 (R^2=0.93), is similar to obtained from previous investigations in this region, which reflected its particular regional meteorological character. The correlation studies with the meteorological parameters, shown a good correlation between δ^{18}O with the amount of precipitation and with the cloud base temperature. Five-day isentropic backtrajectories suggest that the δ^{18}O lower values are associated with event derived from the east and after a sahara invasion event, or with long path trajectories from northwest. The higher values are relative to events derived from northwest and with short pathways. Finally, the synoptic situation of several episodes by significant values registered during the period of study is analyzed.