

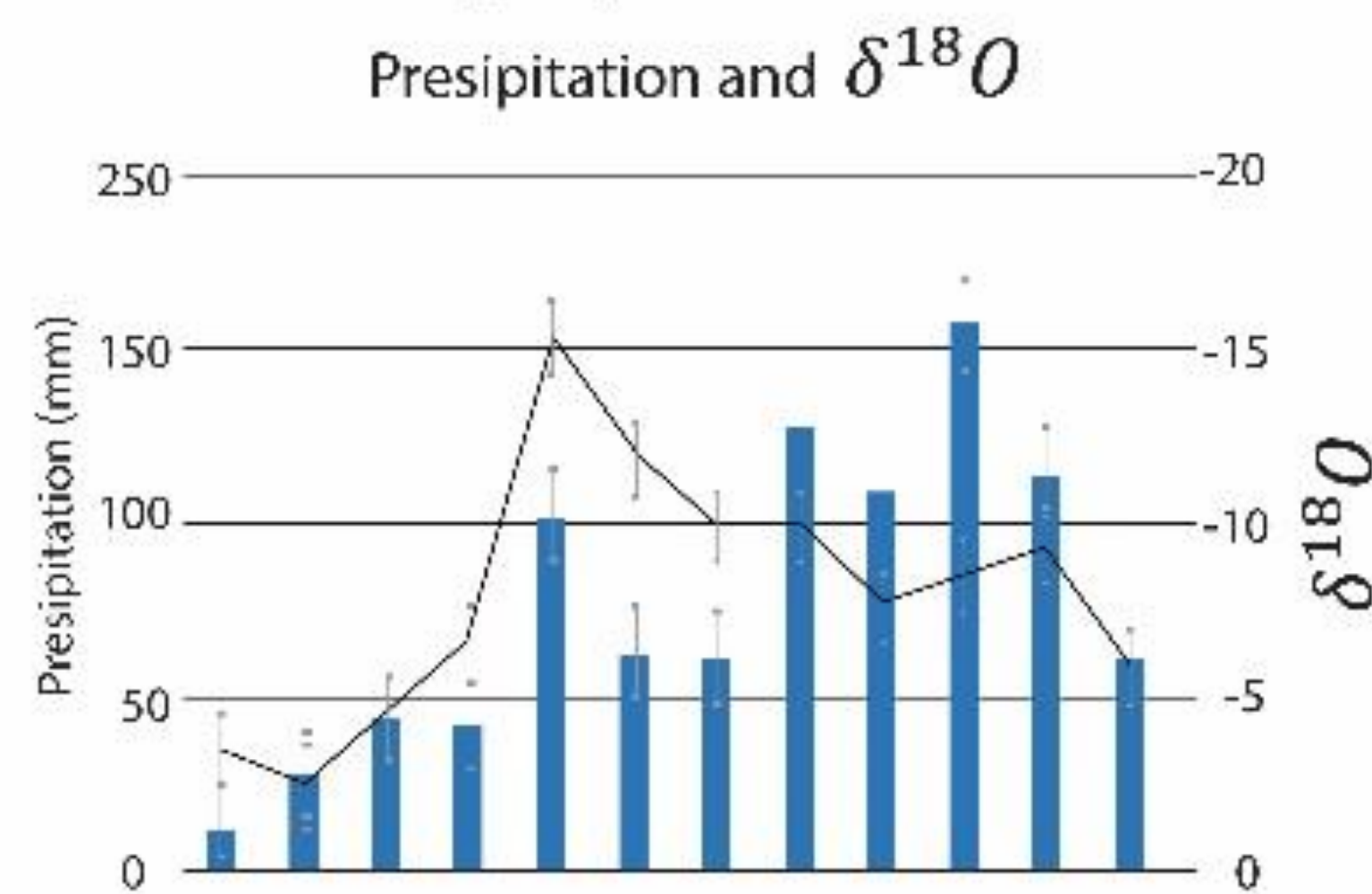
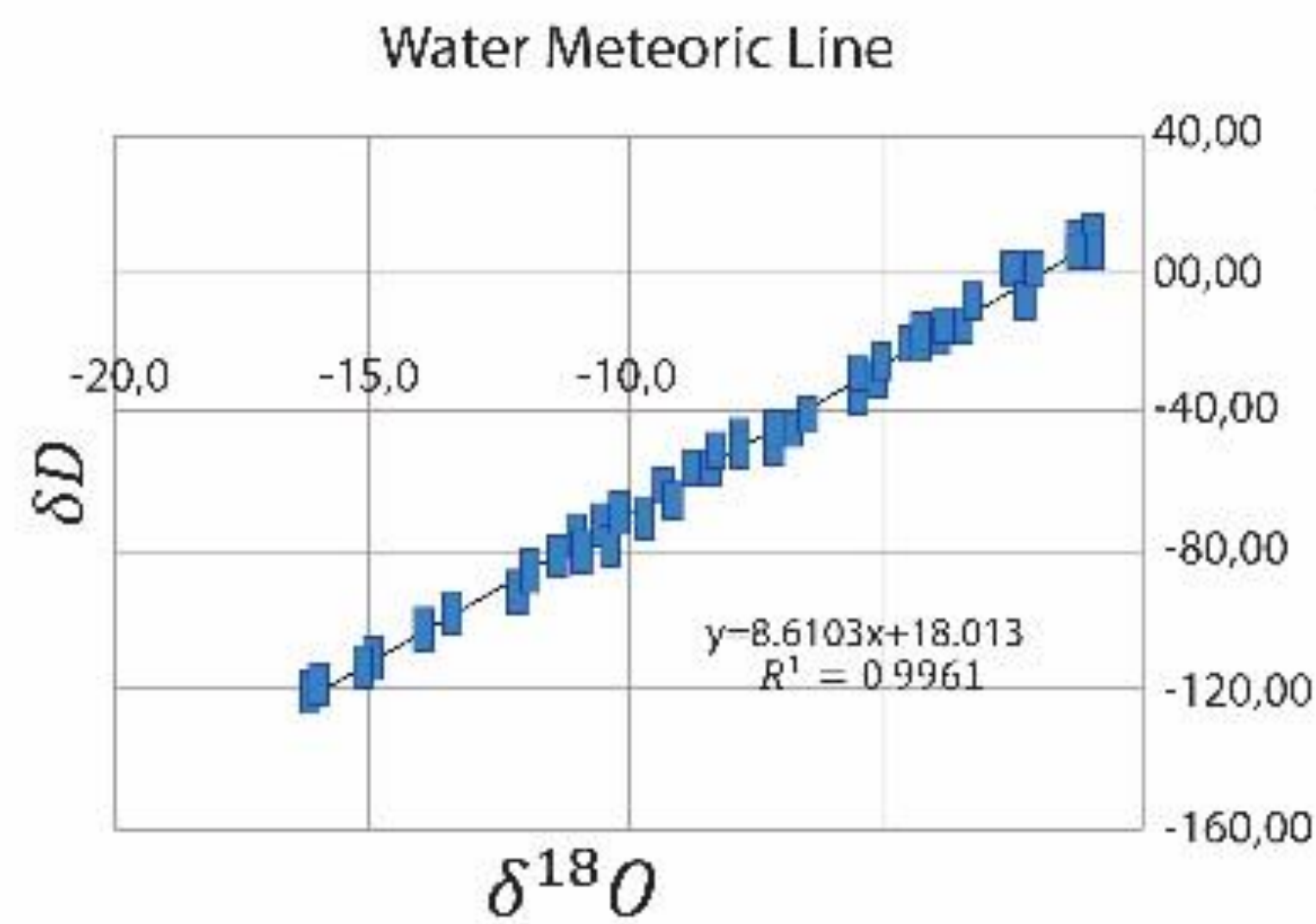
Speleothem Record for the Last 100 kyrs From Colombia, Relationship of ITCZ Shift and Paleorainfall

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We present the first high-resolution, approximately 15 years sample spacing, precipitation record from Santander (Colombia) covering the last 100 kyrs from ^{230}Th -dated stalagmites oxygen isotope records. Our record shows a shift in the mean latitude of the Intertropical Convergence Zone (ITCZ), including the periods corresponding to the Heinrich events, Dansgaard-Oeschger, Last Glacial Maximum (LGM) and Younger Dryas (YD) events, in addition to the Bond events during the Holocene.

Modern Climatology



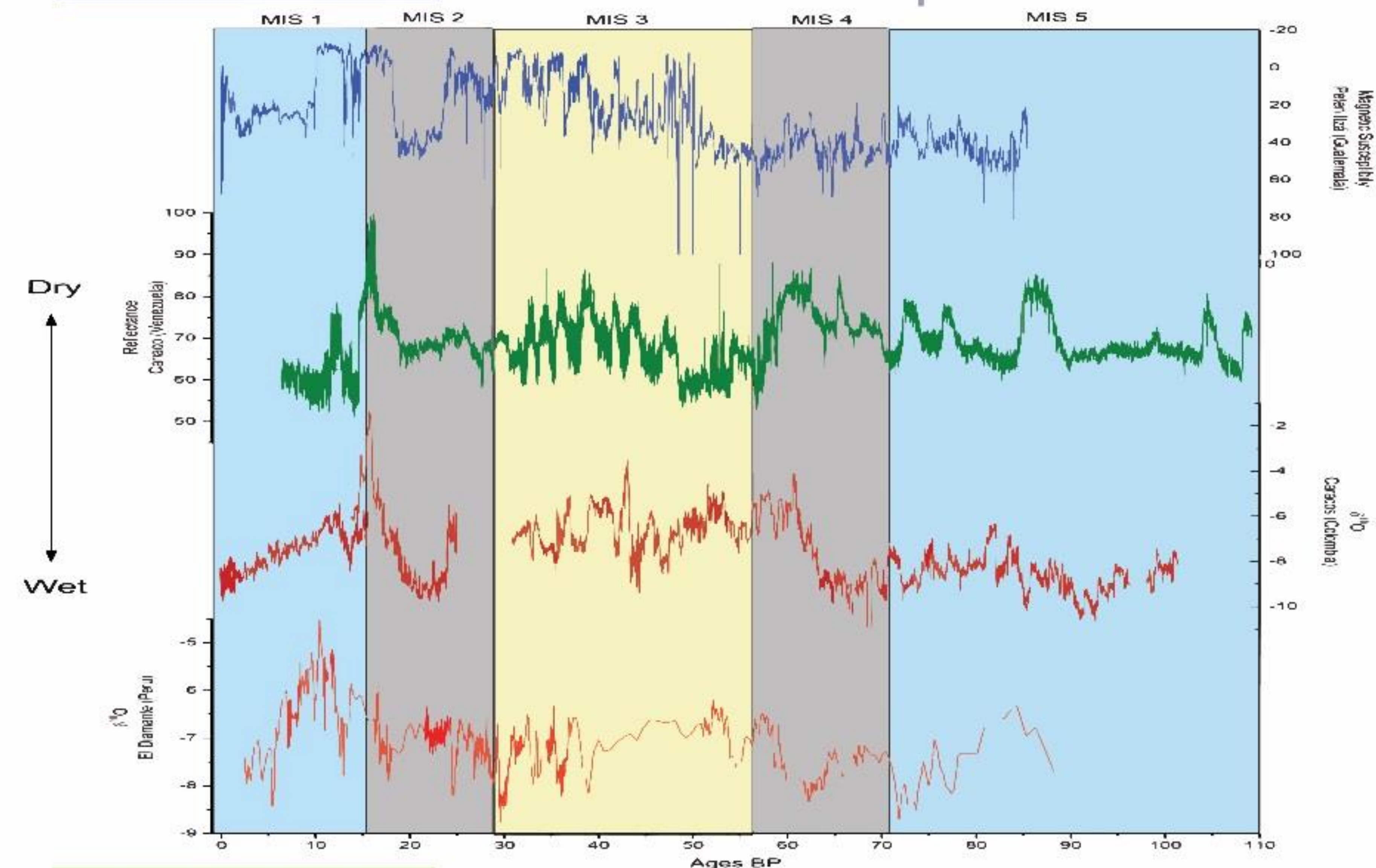
The regional precipitation is dominated by the meridional migration of the Intertropical Convergence Zone (ITCZ) on Atlantic and Pacific Oceans. The study area presents a bimodal annual cycle wet peaks during March-May and September-November, and less rain in June-August and December-February. These peaks are the result of the double passage of the ITCZ, but in the second one has influence of moisture Pacific (Poveda et al, 2006)

Samples and Methods

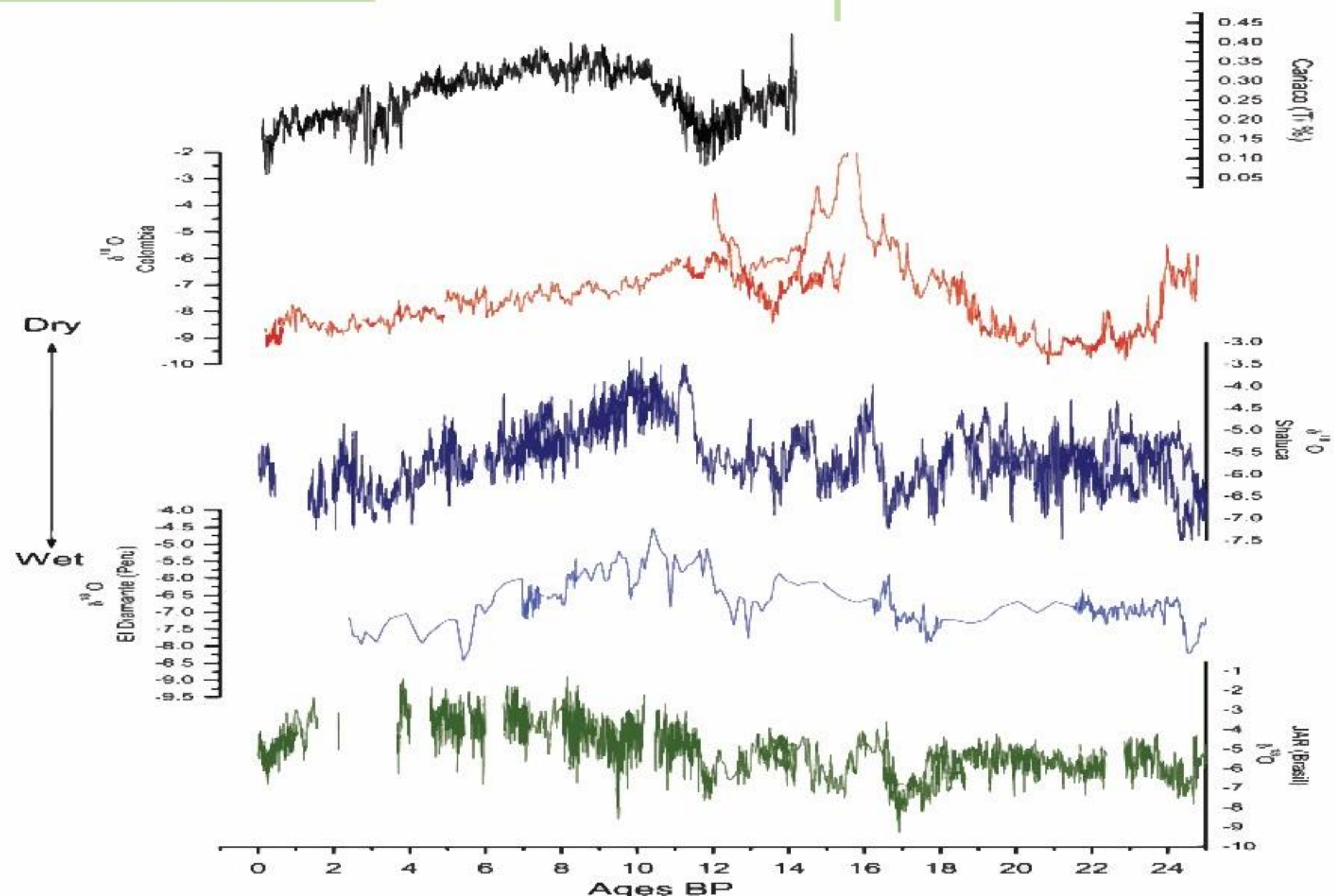
Six stalagmites were collected Caracos cave in central-eastern Colombia; the samples were collected at ~300 m distance from the entrance to the lower chamber in the more restricted cave ventilation. The speleothems were dated by the U-Th, 115 in total with yield errors (2σ) <1%. The isotope profile is composed of 6284 d^{18}O samples, yielding a temporal resolution between 1 yr in the youngest samples and 18 yr in oldest (15 yr on average) and exhibiting a large range of ~3.5‰.



100 ky BP to present



25 ky BP to present



Model experiments suggest that on seasonal to interannual timescales the d^{18}O in precipitation is primarily controlled by the "amount effect" and "source effect" over north South America, where precipitation is fundamentally the result of the shift of ITCZ and moisture from the Pacific. The d^{18}O isotope profiles obtained from the Colombian stalagmites were compared with records from Cariaco (Venezuela), Peten Itzá (Guatemala) and Shatuka (Peru), observing a latitudinal displacement in the Caribbean and northern part of South America. These comparisons give evidence for variations in the position of the ITCZ mainly during the Heinrich with dry conditions and D/O events increase in the precipitation. Similarly, a southern shift of the ITCZ during the Holocene Bond events is observed generating dry conditions in Colombia.