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Dansgaard-Oeschger oscillations during MIS 3 and 4 inferred from a high-resolution study of a stalagmite from Ejulve Cave, NE Iberia

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Previous studies have been demonstrated the high sensibility of the Iberian Peninsula climate to changes in temperature and/or ice volume in the North Atlantic (e.g. during glacial-interglacial transitions). Here, we explore this sensibility during the largest abrupt climate oscillations during the last glacial period, i. e. the Dansgaard-Oeschger cycles. We present an outstanding high-resolution stalagmite record of δ^{18}O, δ^{13}C and Mg/Ca covering the period from 80 to 36 ka continuously. δ^{13}C and Mg/Ca, well correlated along the studied time interval, are interpreted as vegetation activity and hydrological availability, and reflect wet and warm conditions during D/O interstadials. Interpreting the δ^{18}O signal in speleothems of this latitude has proven to be difficult because of the interplay of different (and sometimes opposing) factors. However, the clear correlation between δ^{18}O and δ^{13}C could be interpreted as a consequence of kinetic fractionation linked with degassing dynamics of the drip water, showing high δ^{18}O during dry periods in agreement with previous results in the Eastern Mediterranean (Soreq Cave, Bar-Matthews et al., 2000). Our results accurately replicate the record of Villars cave (SW France; Genty et al., 2003) during D/O events #12, #14, #17, #19 and #20 including the "Villars cold period" (61-67 ka), which is represented by a hiatus in the stalagmites from the French cave. The record from Ejulve cave reveals the structure of D/O cycles with gradual transitions, in contrast to the abrupt warming and steady cooling characteristics of Greenland D/O cycles.