



## **The hydro-climatic history of the Gulf of Cadiz throughout the last ~570 kyr from IODP 339 Site U1386**

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Here we present the first continuous and high-resolution ( $\sim 1$  kyr) benthic  $\delta^{18}\text{O}$  record from IODP Site U1386 (Gulf of Cadiz, IODP Exp. 339) representing the last 570 kyr. We find distinct and periodic  $\delta^{18}\text{O}$  enrichment events overimposed on patterns of global ice volume change as inferred from the global mean  $\delta^{18}\text{O}$  signal (i.e. LR04). These events occur most prominently during glacials, and are characterized by a relative increase of up to 1‰. The observed glacial  $\delta^{18}\text{O}$  enrichment represents a striking difference to deep-sea benthic  $\delta^{18}\text{O}$  records worldwide but is not without precedent as similar  $\delta^{18}\text{O}$  variability can be observed in the planktic signal of the Red Sea (Sites KL11 and KL23). There, similar glacial  $\delta^{18}\text{O}$  enrichment events have not raised particular interest since their occurrence was attributed to sea level induced salinity increase within this virtually landlocked basin. Our results suggest that the glacial  $\delta^{18}\text{O}$  enrichment at Site U1386 present salinity and/or temperature variability related to changes in the position of the frontal zone between subpolar and subtropical water masses within the Gulf of Cadiz. Interestingly, the  $\delta^{18}\text{O}$  enrichments at Site U1386 strongly reflect precession and semi-precession patterns. Since similar patterns can be observed in the Red Sea isotopic records, we argue that part of the inferred sea level reconstructions are biased by a regional and precession controlled mechanism.