HIG-RESOLUTION CARBONATE RECORD AT SANTOS DRIFT (SOUTH-WEST ATLANTIC): AN IMPRINT OF 770 000 yrs DEEP WATER MASSES GEOMETRY EVOLUTION

Toledo, F. A. L.[1]; Costa, K. B.[1]; Quadros, J. P., Camillo Jr. , E[1]; Santarosa, A. C. A.[1]; Ferrarese, H. B.[1]; Hirama, M. V.[1]; Almeida, F. K.[1]; Campos, J. S.[1]; Gonzales, M. V.[1]; Cabarcos, E.[1]

[1]LaPAS – South Atlantic Paleoceanography Laboratory, Oceanographic Institute of the University of São Paulo, Brazil.

ABSTRACT: In this study we present the stratigraphy of four cores from Santos Drift based on high-resolution benthic oxygen isotopes, carbonate content, magnetic susceptibility, biostratigraphy and/or sand fraction (cores GL-854, GL-852, GL-865 and GL-866). All cores show a remarkably similar sediment composition, characterized by continuous sedimentation with cyclic alternations among marls; carbonate-rich mud and carbonate-poor mud. Present sedimentation in the slope of the South Brazil Bight is a combined response to bottom morphology, the cross-isobath flow associated to the BC meandering and the Coastal Water seaward transport. The present supply of terrigenous sediments to the area is limited due to the absence of large rivers in the area. Seismic evidence suggests that sedimentation from Neogene to Recent time was dominated by oceanic circulation redistributing the sediments transferred to the basin during both relative sea-level high stands and low stands, and gives some indication of the path and relative intensity of the bottom currents that passed through the Santos Basin in different climatic–oceanographic conditions. According to our results the higher glacial accumulation rates in Santos Basin are due to the strengthening winds combined to the glacial sea level fall, as the outcropped continental shelf could be a source area for transporting more terrestrial sediments down-slope. In long-term interglacial-glacial cycles, the carbonate curves are almost parallel to the benthic oxygen isotope curve, and then all oxygen isotopic stages and substages are identified in all the records. The cores show an Atlantic-type carbonate stratigraphy with higher values during interglacials and lower values during glacials. It suggests the carbonate sedimentation at Santos Drift is driving by the Atlantic Meridional Overturning Circulation (AMOC) oscillations. During interglacials, when AMOC is strengthened, most of the studied area was under influence of NADW (oxygen-rich waters) so the carbonate content is preserved. Otherwise, when AMOC is weaker, the southern-sourced waters (especially UCDW in our study) move northwards and upwards. As UCDW is oxygen-depleted, the carbonate content in Santos Drift is more susceptible to dissolution. The positive correlation between %CaCO3 and benthic δ13C records supports an influence of deep water masses geometry changes along the Pleistocene, associated to the intensification and weakening of meridional overturning circulation on carbonate saturation at study area.

KEYWORDS: Carbonate Stratigraphy, AMOC, Santos Basin