



Glacial dynamic changes inferred from marine sediments on the Wilkes Land continental margin (East Antarctica)

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The George *Vth* Land represents the ending of one of the largest subglacial basin (Wilkes Basin) of the East Antarctic Ice Sheet (EAIS). Furthermore, its coastal areas are zone of significant production of High Salinity Shelf Water (HSSW).

Piston and gravity cores and high resolution echo-sounding (3.5 kHz) and Chirp profiles collected in the frame of the joint Australian and Italian WEGA (Wilkes Basin Glacial History) project provide new insights into the Quaternary history of the EAIS and the HSSW across this margin.

The analysis of sediment cores and high-resolution seismic data in the continental slope and rise demonstrate clearly that downslope flows are the main transport mechanisms of sediment from the continental shelf to the rise. Turbiditic as well as HSSW downflows containing suspended bioclastic material leave their clear print in the sea floor morphology, throughout the formation and maintain of deep canyons, channel levees and sediment wave fields. However, some areas (WEGA Channel) show that the energy of the depositional processes diminished since M.I.S. 10 suggesting less extensive grounding ice over the shelf. Furthermore, the analysis of sediment cores are consistent with the results obtained from the study of the core and seismic data

over the continental shelf, suggesting that during the Last Glacial Maximum (LGM) and perhaps in earlier glacial times the ice sheet was not grounding over the deepest sectors of the continental shelf and was possibly not reaching the shelf edge.

This trend has been confirmed by preliminary investigations on the 35 meters long Calypso core collected in an adjacent area in the frame of the MDO3 CADO cruise. The sedimentary sequence drilled by this core has a high chronostratigraphic potential, continuous and with a high resolution that could be compared with that one inferring from the ice cores. The comparison and the correlation between the information coming from the glacial marine sediments on the Wilkes Land margin and those inferred from the Dome C ice cores, represent a great opportunity to investigate the relationship between the paleo-climatic changes, the dynamic of the EAIS and the glacial marine depositional environment facing it.

Furthermore, the sedimentary environment investigated in the Wilkes Land is similar with that of the Antarctic Peninsula western continental margin, and analogies has been observed within the sedimentary facies related to the glacial/interglacial cycles. The comparison of the two margins suggests a different glacial dynamic along the Wilkes Land continental margin, characterized by the higher dynamism of the depositional system, and the western (Antarctic Peninsula) margin, more sensitive to small climatic changes. The correlation of the tephra layers observed within the sediment cores collected on the Antarctic Peninsula margin with the volcanic layers on the ice cores (Dome C) represent a key opportunity to correlate the glacial marine and ice sediments and to improve our understanding of the different glacial dynamics of the EAIS and WAIS.