A unique channel-levee-lobe system in a modern deep-water carbonate slope (Great Bahama Bank) (SKT)

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The high resolution seismic data of CARAMBAR cruise (2010) provided a description for the first time of a gravitational channel-levee complex on a modern carbonate slope (Mulder et al., 2014). A lobe was discovered later at the outlets of these channel-levee systems, located on the western slope of Great Bahama Bank (GBB). Both channel and lobe are currently inactive and filled with periplatform ooze and covered with sediment waves. The lobe has dimensions that are consistent with sizes of the channel-levee systems described by Mulder et al. (2014). This channel-levee-lobe complex does not seem directly linked with gullies observed on the upper slope that could supply this gravity system.Detailed sedimentological and stratigraphic (biostratigraphy and 14C) studies were conducted on seven sediment cores located in a gully and a levee, in the filling of the topmost channel and in the lobe. The identification and counting of the sediment particles were essential to understand the origin of the particles and sedimentary processes involved in the formation of this system.The main results show that the channel-levee-lobe system is buried under the MIS1 and MIS2-4. The lobe itself, dated from MIS5, consists in wackestone facies including partially lithified nodules. The compositions of the deposits show no real differences from interglacial to another, revealing a common origin of the sediments (mainly aragonitic needles with a pelagic fraction). During glacial periods, while the platform is exposed, significant contributions of aragonite needles persist. Presence of terrace-like areas deeper than the platform edge allows a production of shallow water carbonates even in times of sea-level lowstands. The sedimentary material is exported from the bank to the slope thanks to density flow cascading and episodic hyperpycnal flows, related to cold fronts or storms/ hurricanes.