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Characterization of carbonate sedimentation in periplatform realms for the analysis of export phenomenon along platform - basin transects

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Off shallow water carbonate bank, periplatform deposits consist of a mixture of autochtonous low-magnesium calcitic pelagic particles and of platform-derived components (low-magnesium calcite, high-magnesium calcite, aragonite). Quantification of platform-derived particles has been attempted for Quaternary sediments. Unfortunately, most of these previous studies are only based on the variations of the sedimentation rates.

In this study, we present a precise assessment of the carbonate sedimentation on proximal/distal transect settings, using a granulometric separation technique. This method produces homogeneous fractions composed by the main carbonate components of the sediment. On this basis, mineralogical, micropaleontological and geochemical (carbon and oxygen stable isotopes) approaches were performed for each type of carbonate particles. These data, related to the quantification of components, allowed us to correctly estimate the proportion of the autochtonous and allochtonous particles present in bulk sediment.

Two transects are studied in this work :

- the leeward margin of the Great Bahama Bank during the middle Miocene (highstand system tract, ODP Leg 166),
- the Maiella platform and the Umbria-Marches basin during the high sea level period of the Cenomanian-Turonian boundary.

The biogenic components were distinguished from carbonate particles "without ge-

netic structure" (macroparticles and microparticles or micarb) in the sediments. This study highlights that the particles "without genetic structure" do not result of a more intensive diagenesis or a fragmentation of pelagic organisms as usually considered (in particular for the micarb) but they are mostly related to an export of fine material from the shallow water areas. Moreover, we show that the majority of the fine carbonate production results from a physico-chemical precipitation.

Finally, the comparison between the two transects shows that the morphology of the margin and the climate, which influence sea level changes and hydrodynamism, drive the highstand shedding. The granulometry and crystallography of exported particles constrain their transport (turbidity current *vs* suspension) towards deep sea realms and lastly, the sea water chemistry of the geological period considered control the mineralogical nature of these particles (aragonitic and/or calcitic mineralizations).