Geophysical Research Abstracts
Vol. 14, EGU2012-4141, 2012
EGU General Assembly 2012

Carbonate platform margins and associated turbiditic systems in response to high aggradation rates: the Palaeogene platform margin in Oman

P Razin (1), F Guillocheau (2), and G. Calves (3)

(1) ENSGID, Institut Polytechnique de Bordeaux, France, razin@ensegid.fr, (2) Géosciences Rennes, France, francois.guillocheau@univ-rennes1.fr, (3) Géoressources, LOA, Toulouse III, France, gerome.calves@get.obs-mip.fr

The aim of this contribution concerns the facies and architecture of an original “shallow water” carbonate turbiditic systems along the Paleogene platform margin in Oman.

Along this margin, the Paleocene-Eocene sequence boundary is characterised by a submarine erosion surface cutting into carbonate hemipelagic deposits. This surface is covered by 50 m thick succession bioclastic calciturbidites localised in a 5km wide incision. Correlations with platform deposits show that this turbiditic system was set up at the beginning of the Ilerdian transgressive phase when high platform aggradation leads to a steeper depositional profile on the platform margin. Both geometric and paleo-ecological data show that these deposits were accumulated below the SWWB in a bathymetry of 200 to 500m.

These deposits have a clear sequential organisation. The decimetre thick genetic unit (GU) is formed by the amalgam of calciturbidites and corresponds to the smallest cycle of flow volume variation. There are grouped to form metre-thick sets of genetic units (GUS) separated by intervals consisting of very low density muddy turbiditic deposits. These genetic unit sets show an overall fining upward trend which illustrates the backstep of the turbiditic system during the maximum flooding and highstand periods.

The architecture of this shallow turbiditic system accumulated on a gently inclined slope is characterised by the development of original undulated “pinch and swell” structures present at different scales. “HCS like” structures of ten-centimetre amplitude and one-metre wavelength are present within some coarse sand-rich turbiditic facies. Locally, genetic units (G.U) themselves present relatively complex metre scale “pinch and swell” structures. These “pinch and swell” structures develop by differential aggradation. This topography is then progressively compensated by the successive turbiditic events draping over the initial structure. Finally, the genetic units sets (G.U.S) have “pinch and swell” geometries at a hectometre to kilometre scale. In the proximal part of the system, these geometries are the results of complex channelisation-accretion-compensation phenomena whereas in the distal part of the system, the “pinch and swell” structures form by differential aggradation and are progressively compensated by the overlying units.