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The Miocene accretionary complex and olistostromes at the front of Betic-Rifian External units (Gulf of Cadiz)

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The study area comprises the external parts of the Betic-Rifean orogen located W of the Gibraltar Arc, between the Gulf of Cadiz and the NW Moroccan continental margin. The geodynamic interpretation of this area is very controversial and the existence in literature of many recent delamination and/or subduction evolution models, characterised by most varied geometries, corroborate this. In this area there is also the eastern termination of the Azores-Gibraltar Transform Zone where plate interactions seems to produce a diffuse crustal deformation (Sartori et al., 1994), expressed by WSW-ENE oriented structural highs, showing evidences of recent compression activity, connected to the recorded seismic activity W of Gibraltar (Zitellini et al., 1999, 2001; Gracia et al., 2003). In the past many authors have described and interpreted large volumes of allocthonous material characterised by high diffractive and opaque seismic signature at the front of external structural elements of the Betic-Rifian orogen and in the Horseshoe Abyssal Plain. By interpretation of the ArcRif92 deep seismic reflection data, first Torelli et al. (1997) subdiveded Giant Chaotic Body (GCB) W of Gibraltar in: a) mainly gravity deposits (olistostromes) and b) tectonic mélange portion (accretionary wedge). Furthermore, they assumed that the gravity driven sector of GCB represent huge flow deposits of intrabasinal origin (endo-olistostromes) discharged by adjacent structural highs, in turn formed in response to the paroxysmal phase of Africa-Eurasia convergence. Recently, SISMAR 2001 deep seismic reflection and refraction data reveal, in its entirety, the W-vergent accretionary wedge related to external portions of the Gibraltar Arc (Gutscher et al., 2003). The recent re-interpretation of complete ArcRif92 and some IAM93 and SISMAR2001 deep seismic profiles, has been carried out in the general framework of european "SWIM" Euromargins program. Confirming the hypothesis of Torelli et al. (1997), this work has allowed to understand the real

nature of the GCB lying in the Horseshoe Abyssal Plain and its connection with the Gibraltar Arc accretionary wedge. This is made up of at least three main confined intrabasinal chaotic bodies (endo-olistostromes), accumulated from oldest to youngest in the Early(?)-Middle Miocene to Late Miocene. They partially overlap one another and both theirs depocenters and lateral pinch-outs show a distinct migration trend from W to E. This fact is in clear opposition with the propagation from E to W of the Gibraltar Arc accretionary wedge. Three endo-olistostromes also show deformation prior to the accretionary wedge thrusting, occurred in the latest Miocene, onto their eastern terminations. Olistostromes that really come from the accretionary wedge front and accumulated on both S Portuguese continental margin and N Moroccan continental margin are all later compared to the deposition of the three main endo-olistostromes lying in the Horseshoe Abyssal Plain; furthermore, the formers have volumes, thicknesses and lateral extent of scale much inferior than the latters.

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