A04

Structuration and Subsidence of the French Guyana Hyper-oblique Margin

F. Sapin (Total), J.C. Ringenbach (Total), M. Dall'Asta (Total), M. Lahmi (Total), H. Rojas (Total), M. Davaux (Université Pierre et Marie Curie) & G. Baudot* (Total)

SUMMARY

The discoveries of Tupi in 2007 and of Jubilee Fields in 2006 have triggered a black gold rush on the world’s passive margins. Evolving extensional models in the distal area of margins in the Academy together with an increasing number of high quality and deeper seismic data (3D datasets, long offset acquisition, SPAN 2D, Broadseis, etc.) lead to develop new ideas and concepts for the deformation and subsidence history of Passive Margin in general and sheared margin (hyper-oblique or transform margins) in particular.
**Introduction**

The discoveries of Tupi in 2007 and of Jubilee Fields in 2006 have triggered a black gold rush on the world’s passive margins. Evolving extensional models in the distal area of margins in the Academy togethe with an increasing number of high quality and deeper seismic data (3D datasets, long offset acquisition, SPAN 2D, Broadseis, etc.) lead to develop new ideas and concepts for the deformation and subsidence history of Passive Margin in general and sheared margin (hyper-oblique or transform margins) in particular.

Involved in the exploration of the French Guyana, we are proposing an insight in both syn- and post-rifting deformation mechanisms and associated subsidence. Throughout regional studies, detailed mapping and cross-sections, and thanks to the important datasets available in both 3D and deep 2D seismic, a model of structuration and subsidence of this hyper-oblique segment of the Equatorial Atlantic is proposed.

Because of its obliquity, the French Guyana margin is particularly narrow and the complete thinning of the crust if localized on few major normal faults (2 to 3). This margin is also particularly sheared by major transfer zones. Associated to this dextral strike-slip component, the distal domain exhibits a Moho high on the seismic sections with associated local high-amplitude strata in the syn-rifting sediments interpreted as magmatic sills. This mechanism of distal extension induced an early subsidence of the distal part of the margin recorded by the emplacement in the Early Albian of a deltaic system coming from the Demerara Plateau in the West. This late-rift subsidence is enhanced by the beginning of the drifting during which the thinned crust reached its new thermal/isostatic equilibrium in the Cenoman-Turonian. Supposedly associated to the Andine tectonics, the rise of the Purus arch (fore-bulge?) in the Guyana Craton led to a starving of the margin and large uplifts onshore. It caused another modification of the bathymetric profile. Last but not least, the Amazonas deposition by the Late Miocene-Pliocene provoked a large subsidence in the distal domain and small uplifts in the onshore domain.

This evolution points out the influence of the late-rifting distal processes of thinning on the early bathymetric profile and shows that multiple parameters can control and disturb this profile during the Passive Margin stage.