

# Structural context of the Bouillante area: Contribution of high resolution marine geophysical surveys (western shelf of Basse-Terre Island, Guadeloupe, French West Indies)

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**Structural context of the Bouillante area: Contribution of high resolution marine geophysical surveys (western shelf of Basse-Terre Island, Guadeloupe, French West Indies)**

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In order to understand the structural context of the *Bouillante* geothermal field, ADEME and BRGM has carried out offshore studies on the western shelf of Basse-Terre Island. Detailed analysis of high-resolution seismic, bathymetric and magnetic data allowed determination of the origin of the submarine topography, distribution of the sedimentary units, morphology of the basement and offshore continuation of the tectonic structures identified onshore.

The present-day morphological features of the shelf are mainly related to the latest post-glacial deposits. Off the *Bouillante* bay, a thick sedimentary deposition has induced an important widening of the shelf, thus hiding the real morphology of the basement. The sedimentary cover has recorded two major erosions – low sea-level phases, the last one being correlated with the last 20 ky glacial maximum.

The main faults, offshore the geothermal field anomaly, have been mapped. The N160°W escarpment, which bounds the shelf, may be a major sinistral strike-slip system, playing the role of transfer zone between the N140 *Montserrat* and *Les Saintes* systems. The N140-trending faults and NE-SW faults were also observed on the shelf. The EW-trending *Bouillante—Capesterre* fault system, which belongs to the *Marie-Galante* graben system (e.g. Feuillet et al., 2002), extends into the *Bouillante* bay. This structure cuts the whole western shelf as well as the N160 and N140-trending faults, and controls the morphology of the basement. South of *Bouillante* Bay, a volcanic edifice of the *Bouillante* chain extends over the shelf in the axis of the andesitic submarine volcanoes. The 3D structural model (Calcagno et al., in this congress) allows to confirm the land-sea prolongation of the structures, and to specify the relationships between the fault sets.

This study confirms that the *Bouillante* area is a key sector of regional geodynamic interest in the Lesser Antilles Arc.

Feuillet N., Manighetti I., Tapponier P. and Jacques E. (2002), Arc parallel extension and localization of volcanic complexes in Guadeloupe, Lesser Antilles, *J. Geophys. Res.*, 107(B12), 2331.