



Active Tectonics in Los Muertos Trough area (North-East Caribbean plate): From reprocessed seismic reflection profiles.

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On the North-eastern Caribbean plate boundary zone, the main motion between the Caribbean and the North American plates is produced by means an oblique subduction along the Puerto Rico Trench, taking place underthrusting and left-lateral strike-slip westwards (Mann et al, 2002). However, new on-land and on-sea surveys documented other possible boundary plates; therefore, a microplate tectonic setting has been suggested for this diffuse boundary in the northeast corner of the Caribbean plate (Byrne et al, 1985; Mann et al, 2002).

In the south of the eastern Greater Antilles (Hispaniola and Puerto Rico), the Muertos Trough is one of these proposed minor boundaries plate where a lesser slip accommodation is taking place. Here, from multichannel reflection profiles, a convergent process of deformation of the oceanic crust of Venezuelan Basin northwards beneath the island arc has been documented (Ladd et al, 1977). This compressive deformation, sometimes interpreted as a subduction process, has been confirmed by Biju-Duval et al (1982) from on-land geology of southern Hispaniola, by Byrne et al (1985) from seismological data, by Granja et al (2006) from multibeam data.

Here, we present the results obtained from the reprocessing of multichannel seismic profiles acquired on IG1503 (1975) and EW9501 (1995) surveys. The data processing has consisted of a thorough migration from stacked profiles. We have mainly applied

the Memory Stolt F-K Migration Method (implemented in ProMax software) obtaining a very improved images, in which is possible to do a better interpretation of seismic stratigraphy and shallower structures, in the Venezuelan Basin, in the Muertos Trough and in the accretionary prism.

Our interpretation of the new seismic images supports a very active tectonics, affecting to the recent pelagic and turbiditic sediments which are strongly folded and faulted. The seismic reflection data shows in the lower inner slope part or all these sediments off scraped and frontally accreted forming a sequence of several imbricate thrusts. In the upper inner slope appear numerous trench slope basins related with the thrusting activity (piggy-back basins), they are characterized by high asymmetric development. All these structures can be explained in a tectonic transpressive setting where the convergence decreases eastwards, where the strike-slip component is dominant. These features are observed in all seismic profiles which cross the deformation front; the western profiles have an accretionary prism more developed than the eastern ones. Therefore, we can analyze the lateral variation of the structure and the dominant processes along the Muertos Trough and the associated accretionary prism.