Late Cenozoic extensional faulting in Central-Western Peloponnesus, Greece

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1 Introduction and background

A crucial geological field established during the Late Pliocene–Quaternary times in Peloponnesus, SW Greece (Fig. 1). The distribution of Pliocene–Quaternary deposits, closest to the Peloponnesus foreland, is dominated by NE–SW compressive stress field, and NW–SE stretching direction while the central and south Peloponnesus is characterized by E–W extension and N–S extension in its northern sectors (Karanis et al., 1992).

This study deals with the northern extensional sector of the Peloponnesus focusing on the following aspects: 1) How the extensional episodes were superimposed on pre-Negene compressional events; 2) the timing of the Late Cenozoic extensional. 3) and the geometry and kinematics of the extensional events in order to understand how the faulting in different stretching regimes is expressed and how these different regimes interact.

2 Late Cenozoic extensional faulting and basin configuration

A series of north-vergent, north–south–trending and north–south–oriented extensional faults (Fig. 2). The latter comprises HP/LT of the Phylakopi Quarantine Unit (Pa), overlain by the Cenozoic flysch of the Tripoli Unit while the basement map is the Hymen Unit. A Mesozoic sedimentary sequence, topped by a Paleocene flysch. Most of the Mesozoic sediments were affected by Palaeogene–Neogene extensional activity. The most significant of these faults is a low-angle listric fault system with NNW-SSE trends causing NE–SW extension in the south and east, and NW–SE extension in the north and west. The NW-NE trending extensional fault architecture has resulted (i) in the formation of a synclinal structure of the overall tilting to the north or northwest. The NW-NE trending extensional fault architecture has resulted (ii) in the formation of a synclinal structure of the overall tilting to the north or northwest.

The combination of these extensional faults (which may have been distorted locally by the movement of the Tripos Unit against its flysch or the Pindos Unit or the Neogene-Quaternary deposits and the distribution of the extensional faults with NNW-SSE trends) is characterized by an increase in relief by an additional ENE-WSW shortening.

3 Synthesis and Geodynamic Implications - Conclusion

Two major tectonic phases and syntheses, one affecting the different parts of the study area, a second one affecting the Late Cenozoic compressive and extensional events caused in the Palaeogene–Neogene tectonic events in the Peloponnesus. The Upper Cenozoic extensional fault system has developed in response to rapid shortening of the Peloponnesian basin in the Late Quaternary, resulting from the combined action of the NE–SW shortening and the NW–SE extension perpendicular to the belt axis and an E–W extension fault systems causing ocean-parallel stretching.