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North-south relay structures in the Xylocastro area (Corinth Gulf, Greece).

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A large number of studies have documented the structural architecture of the Corinth Gulf, specially the E-W trending major normal faults accommodating the main extensional stress. However, the role of several N-S oriented structures which crop out in the field or are revealed by geophysical methods are not clearly understood. Based on our geological data, mainly collected nearby Xylocastro, we describe the N-S oriented tectonic activity in this area. The mapped inland faults appear to correspond to off shore structures identified in seismic surveys and appear to have acted as a major relay zone during the Corinth Gulf opening. Recent seismological observations in the Corinth Rift may be attributed to the oblique faults acting as relay structures. Since the year 2000, a part of the seismic activity recorded in the western part (in the Aigion area) is located on faults oriented N-S to N40°E (Lyon-Caen et al., 2004). In the field, these structures are not clearly linkable to topographic elements. We present some key field data indicating that activity along N-S faults acted as relay structures between major E-W striking normal faults. Reconstruction of the paleo-topography based on sedimentary facies and the environment of clay mineral formation reveals the relay zones played an important role in controlling both relief and depositional conditions of the Gilbert Fan. Acquired data from the Xylocastro area indicate that

the relay structure of the main E-W extensive faults is more complex than predicted in the model of Peacock (2002). N-S faults could be linked to main morphological breaks, as described by Armijo et al. (1996). Fonissa River represents the trace of a main transform fault zone in the Xylocastro area. These relationships allow us to: - (1) Interpret several morphological elements as representing a N-S fault zone that acts as relay zone between major E-W faults. Similar relationships are observed, for example, in the Aigion-Pyrgaki-Diakofto area, where gravimetric investigations indicate the presence of transverse faults corresponding to the hydrographic network (Mrlina, 2004). - (2) Explain some shifts between different parts of major E-W extensive faults and the absence of overlap in numerous cases. Strictly speaking faults do no overlap but either intersect or truncate each other. As a consequence, relay ramps as described by Peacock (2002) and Peacock and Purfitt (2002) are not clearly observed in the Xylocastro area. The origin of this orthogonal transverse fault network may be inherited from the compressive Hellenid structures as proposed by Ghisetti and Vezzani (2004). They suggested that set of reactivated N15°E faults may control the propagation of the E-W faults and sedimentation during the Plio-Pleistocene episode of rifting. Our field observations combined with analytical results allow us to construct a paleotopographic model for the southern edge of the Corinth Rift in the Xylocastro region, which we consider to be applicable to other segments of the gulf area. supported by GdR Corinthe