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Morphotectonics of the Psathopyrgos active fault, western Corinth Rift, Greece.

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The Psathopyrgos fault is located at the western end of the Gulf of Corinth which is considered as a paradigm of an active rift system in Greece. This rift was formed by normal slip on big faults which extend the crust of the Earth in the N-S direction. An average opening rate of the rift is about 1 cm/year, increasing to the west. The morphotectonic indices along the fault (hypsometric curve, hypsometric integral, drainage basin asymmetry, ratio of valley floor width to valley height (Vr), mean slope of triangular facets) have been calculated using the ArcGIS software. We also extended our analysis to the greater western Corinth rift area using an elevation data set of a mosaic of four 1:50000 maps sheets of the Greek Army from where we built a 20-m Digital Elevation Model (DEM). The normal faults of the greater area have been extracted by use of the DEM mosaic, satellite images from Landsat 7 ETM+ and SRTM data of 90 m resolution. In addition, the faults were located precisely by collecting fault plane coordinates using field GPS. Our results highlight the recent activity of the Psathopyrgos normal fault on the basis of a series of morphotectonic evidence and suggest the existence of a single fault segment for a distance of 16 km. The footwall area of the Psathopyrgos normal fault is uplifted by 0.7-0.8 mm/year (Houghton et al., 2003) during the last 175000 years. Based on the morphotectonic indices, the footwall elevation profile follows an elliptical shape and the footwall tilt direction switches from east to west along strike. From these observations, we suggest that Psathopyrgos is an isolated fault segment. Moreover, we observed a weak correlation between the average slope of triangular facets and lithology (facets are generally steeper on limestone). The variation of Vr ratio along the fault shows values > 1 at distances $2 – 7$ km away for the east end. In additional, we detected that the values of the Vr in the both ends of the

fault are the lowest. This observation may suggest that these areas have experienced very recent uplift and intense down-cutting as a result of bi-directional fault growth.