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Paleoseismological evidence for repeated earthquake activity in Kenchreai fault (southeastern Gulf of Corinth, Greece)

Vasiliki Zygouri (1), Sotirios Kokkalas (1), Gerasimos Papadopoulos (2), and Ioannis Koukouvelas (1)

(1) Department of Geology, Division of General, Marine Geology and Geodynamics, University of Patras, Patras 26500, Greece (zygouri@upatras.gr), (2) Institute of Geodynamics, National Observatory of Athens, Lofos Nymfon, Thissio, 118 10, Athens, Greece (papadop@gein.noa.gr)

The Gulf of Corinth in Greece and especially its southeastern part is dominated by a series of step – like north facing normal faults hosting strong earthquake events. The Kenchreai fault zone, located along the Gulf's southeastern coast, is a key fault for analyzing how a north facing fault accommodates N – S extension in the back – arc region. This fault is selected as a well known fault that triggered devastating earthquakes, resulting in the subsidence of its homonymous harbor, operating since antiquity. Despite the spectacular scarp of the Kenchreai fault, which controls the morphological characteristics of the region, our knowledge for fault's earthquake history comes only from historical data. The application of paleoseismological techniques and morphotectonic analysis, offer us the opportunity to investigate the characteristics of past seismic events along this fault trace. Trench excavation in the hanginwall block of the Kenchreai fault sheds light on three past events. The recurrence interval of these events is not systematic and ranges between 5000 and 1000 years, showing shorter intervals in the last 2000 years. Furthermore, the maximum earthquake magnitude, based on empirical relationships, is estimated on the order of 6.3, whereas the slip rate of the fault is on the order of 0.25mm/yr, corresponding to the slip rate of other major fault structures in the area related with similar earthquakes.