**Title:** The Corinth Rift Laboratory, Greece (CRL) : A Multidisciplinary Near Fault Observatory (NFO) on a Fast Rifting System

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## Abstract

The western rift of Corinth (Greece) is one of the most active tectonic structures of the euro-mediterranean area. Its NS opening rate is 1.5 cm/yr ( strain rate of 10-6/yr) results into a high microseismicity level and a few destructive, M>6 earthquakes per century, activating a system of mostly north dipping normal faults. Since 2001, monitoring arrays of the European Corinth Rift Laboratory (CRL, www.crlab.eu) allowed to better track the mechanical processes at work, with short period and broad band seismometers, cGPS, borehole strainmeters, EM stations, …). The recent (300 kyr) tectonic history has been revealed by onland (uplifted fan deltas and terraces) and offshore geological studies (mapping, shallow seismic, coring), showing a fast evolution of the normal fault system. The microseismicity, dominated by swarms lasting from days to months, mostly clusters in a layer 1 to 3 km thick, between 6 and 9 km in depth, dipping towards north, on which most faults are rooting. The diffusion of the microseismicity suggests its triggering by pore pressure transients, with no or barely detected strain. Despite a large proportion of multiplets, true repeaters seem seldom, suggesting a minor contribution of creep in their triggering, although transient or steady creep is clearly detected on the shallow part of some majors faults. The microseismic layer may thus be an immature, downward growing detachment, and the dominant rifting mechanism might be a mode I, anelastic strain beneath the rift axis , for which a mechanical model is under development. Paleoseismological (trenching, paleoshorelines, turbidites), archeological and historical studies completed the catalogues of instrumental seismicity, motivating attempts of time dependent hazard assessment. The Near Fault Observatory of CRL is thus a multidisciplinary research infrastructure aiming at a better understanding and modeling of multiscale, coupled seismic/aseismic processes on fault systems.

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