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Monitoring of Active Fault through Limestones

A natural laboratory is being created in the Gulf of Corinth by the European Union, national and private research centers, oil companies and geophysical contractors the CORINTH RIFT LABORATORY (CRL). The goal is to understand the relationship between faults/fractures, fluid flow, stress and fault mechanics. Displacement, velocity, tilts, fluid flow, fluid chemistry and stress will be recorded over an area of 30x30 km and at depth on monitored active faults. In order to achieve a continuous record of both fluid flow and strain, two new permanent captors will be designed and tested: one based on downhole electrical surveys and one based on optical fiber-Bragg-gratings to monitor the long-term evolution of deformation of a major fault at large depth. The studied faults affect Cretaceous carbonate rocks similar to the ones that constitute the reservoirs of many hydrocarbon fields (southern Italy, Middle East Ö). Data will be integrated through description of the fracture network, modeling of fault behavior, modeling of fluid/rock interactions, and modeling of micro-seismicity in terms of stress changes and fluid pulses. The program started by May 2000 and the first well will be drilled and cored through the fault during the fall 2001. Faults has been mapped, sampled and dated on outcrops. Current water are also sampled and monitored in order to have a quantitative description of the fluid/rock interaction. Strain and acceleration are permanently monitored from now couple of years in shallow boreholes. The existing data set as well as the complete experiment will be showed.