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Mobilization of evaporites in tectonically active terrains

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The role of evaporites, mostly halite, during seismic sequences is investigated using evidence from certain earthquakes with magnitude between approximately 6.0 and 7.2 which occurred in the last 60 years in the Zagros Mts. (Iran) and the Ionian Sea (Greece); i.e. two seismically active areas, characterized by evaporite-associated decollements and more shallow decollements combined with mature, along-thrusts intrusions.
Studied earthquakes produced either large scale surface deformation, or were covered by high-resolution and accuracy GPS and INSAR data, permitting to fully recognize the deformation pattern.
In all cases an "atypical", tectonic deformation pattern was observed, ranging from apparently "impossible" patterns (thrust and normal faults, sub-parallel and homothetic; 1953 Cephalonia earthquake, Greece) to rather diffuse tectonic patterns, even to "phantom" earthquakes (Zagros).
Careful analysis and modeling of the surface deformation data, in combination with the available geological, geophysical and seismological data permits to recognize, and even to quantify differences between deformation observed, and that expected in ordinary environments. In particular, it was found that during earthquakes evaporites were mobilized, and this led either to a secondary deformation of the overburden, fully detached from the basement, or to significant aseismic (post-seismic) deformation. Anomalies in the distribution of seismic intensities due to evaporitic intrusions along faults were also observed.
Apart from seismological implications (unpredictable post-seismic deformation, possibly also in the far-field), these results deriving from regions at different levels of evaporitic evolution, may prove useful to understand patterns of mobilization of evaporites during periods of tectonic activity.