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Active tectonics of the broader Aegean area and its relation to deep structure: What have we learned during the last 4 decades for this complex geophysical laboratory?

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The main target of the present work is to present information regarding the active tectonics of the broader Aegean area, as this has been derived from a variety of geophysical, neotectonic and geodetic studies of the last 4 decades. The main milestones of this large number of studies are examined and we present the more important results that allowed to gradually understand the role of four main geotectonic features that control the present-day Aegean tectonics, namely: the Hellenic subduction (Benioff zone, slab pull), the westward migration of Anatolia, the anti-clockwise rotation of the southern Adriatic and the orogenic collapse. The combined effect of these factors results in a complicated geotectonic setting, which is also reflected in the deep structure of the area and which makes the Aegean a complex but intriguing geophysical laboratory for geoscientists.

The active stress field of the Aegean area is examined using recently obtained results from earthquake fault-plane solutions and neotectonic studies. Although different faulting patterns can be found for the broader area, a clear separation of the outer Hellenic arc thrust faulting with the ˜E-W trending back-arc normal faulting can be found, with a narrow zone of ˜N-S trending normal faults in between. Strike-slip faulting dominates along the North Aegean Trough, which represents the continuation of the North Anatolia Fault in the Aegean, as well as the broader Ionian island area. Careful examination shows that these four areas of different active faulting partially overlap, suggesting an often gradual spatial variation of the stress-field in the study area. However, analysis of the detailed features of the stress field and its relation to

neotectonic observations for several sub-regions shows a significant small-scale variation of the principal stresses and the corresponding active faulting, which confirms the role of pre-existing fault structures for the Aegean active tectonics.