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The junction of Hellenic and Cyprus arcs: a detailed study of the morphology and Neogene tectonic evolution of the Anaximander Mountains

J. Cranshaw (1), A. Aksu (1), J. Hall (1), G. Çifçi (2), D. Dondurur (2), and C. Yaltırak (3)

(1) Memorial University, Earth Sciences, St. John, Canada (jeremyh@mun.ca), (2) Institute of Marine Sciences and Technology, Dokuz Eylül University, Izmir, Turkey, (3) Department of Geology, Mining Faculty, Istanbul Technical University, Turkey

The Anaximander Mountains are enigmatic highs located at the complex corner that links the Cyprus and Hellenic Arcs in the eastern Mediterranean. They are made up of several different highs: Anaximander (sensu stricto), Anaxagoras and Anaximenes. Previous work had shown that rock samples from the Anaximander Mountain have affinity with rocks exposed on land nearby in southern Turkey. This had been explained by rifting of the Mountain away from Turkey. In contrast to that, our interpretation of around 1750 km of high-resolution multi-channel seismic reflection data acquired in 2001 showed that Anaximander Mountain is part of a broadly south-verging Miocene thrust system associated with relative southward motion of the Tauride Mountains in southern Turkey. Post-Miocene motion also involves thrusting but is accompanied by transpression and rotation.

The 3-dimensional nature of the geology makes mapping of the linkage of structures difficult, so we collected an additional 500 km of multi-channel seismic reflection data acquired in 2007, extending our 2001 survey further southwards into the Mediterranean Ridge. These new profiles are shot in a grid oblique to that obtained in 2001, such that the new profile intersections provide a basis for better correlation of the earlier data. We are testing our earlier interpretation through processing and interpretation of these new profiles. Here, we present examples of the new profiles and give first indications of how our earlier interpretation is broadly corroborated by the new data, but with minor adjustments. Anaximenes Mountain is imaged to the south of our previously-mapped area and is characterized as a large south-verging thrust lifting pre-Messinian strata by up to 2 km in a 12-km wide pop-up structure. Internally, Anaximenes is dissected by several splays from the bounding thrusts.