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A new plate tectonic concept for the eastern-most Mediterranean

C. Huebscher (1), A. McGrandle (2), G. Scaife (3), R. Spoors (3), and T. Stieglitz (4)

(1) University of Hamburg, Institute of Geophysics, Hamburg, Germany (christian.huebscher@zmaw.de), (2) BigAnomaly Ltd., (3) Spectrum, (4) Spectrum Geo Inc

Owing to the seismogenic faults bordering the Levant-Sinai realm and the discovery of giant gas reservoirs in the marine Levant Basin the scientific interest in this tectonically complex setting increased in recent years. Here we provide a new model for the Levant Basin architecture and adjacent plate boundaries emphasizing the importance of industrial seismic data for frontier research in earth science. PSDM seismics, residual gravity and depth to basement maps give a clear line of evidence that the Levant Basin, formerly considered as a single tectonic entity, is divided into two different domains. Highly stretched continental crust in the southern domain is separated from deeper and presumably Tethyan oceanic crust in the north. A transform continuing from southwest Cyprus to the Carmel Fault in northern Israel is considered as the boundary. If this interpretation holds, the Carmel-Cyprus Transform represents a yet unknown continent-ocean boundary in the eastern Mediterranean, thus adding new constrains for the Mediterranean plate tectonic puzzle. The Eratosthenes Seamount, considered as the spearhead of incipient continental collision in the eastern Mediterranean, is interpreted as a carbonate platform that developed above a volcanic basement. NW-SE trending strike-slip faults are abundant in the entire Levant region. Since this trend also shapes the topography of the Levant hinterland including Quaternary deposits their recent tectonic activity is quite likely. Thus, our study supports previous studies which attributed the evolution of submarine canyons and Holocene triggering of mass failures not only to salt tectonics or depositional processes, but also to active plate-tectonics.