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Coastal large earthquakes and evidence for paleotsunami deposits along the Mediterranean coast of Egypt

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Tsunami deposits and dragged large boulders are investigated along the Mediterranean coast of Egypt in the framework of the EC-Funded ASTARTE project (Assessment, Strategy And Risk Reduction for Tsunamis in Europe - FP7-ENV2013 6.4-3, Grant 603839) and the French-Egyptian IMHOTEP project. The targeted zones located west of Alexandria are selected according to historical earthquakes and related inundation events as recorded in archives. Field investigations include: 1) Coastal geomorphology along estuaries, wedge-protected and dune-protected lagoons, and terrace-platforms as potential sites for paleotsunami and boulder records and 2) Investigations of paleotsunami deposits and their spatial distribution using trenching and coring. The two selected sites at Kefret Saber (immediately west of Marsah Matrouh town) and near El Alamein village are inner lagoons protected by 2 to 40-m-high dunes parallel to the shoreline. Five trenches and six cores dug in Kefret Saber revealed 5 to 10-cm-thick white sand unit with highly reworked fossil-rich and shells at about 20 to 40-cm-depth, intercalated in light brown laminated sandy and sandy-clay deposits. An almost identical white sand observed in a trench and 12 cores at Alamein show a succession of coastal sedimentary units with among them catastrophic deposits with mixed sand, gravel and broken shells. A total of 50 samples of organic deposits and charcoal fragments were collected from both sites, among which 20 samples have been dated. Dated charcoal in deposits above and below the white sand unit lead us to correlate with the 24 June 1870 major earthquake (M 7.5 - 8.0?) that generated a tsunami with the inundation of Alexandria harbor. Major seismic sources being along the Hellenic subduction zone and Cyprus arc, our progress study of paleotsunami deposits and their distribution along the Egyptian coast will help in a better constraint of the size and recurrence of tsunamis, and their propagation over the east Mediterranean regions.

