



Tsunami Scenarios from Large Earthquakes in the NE Atlantic: the Gloria Fault and the Southwest Iberia Margin case studies

Maria Ana Baptista (1,2), Rachid Omira (1,3), Jorge Miguel Miranda (1), Josep Batllo (1), Nuno Lourenço (1,3)
(1) Instituto Dom Luiz, Universidade de Lisboa, Portugal (mavbaptista@gmail.com), (2) Instituto Superior de Engenharia de Lisboa, Portugal, (3) Instituto Portoguês do Mar e da Atmosfera, Portugal

In the North East Atlantic (NEA) basin, the threat of tsunami of tectonic origin comes from regional sources located in the South West Iberian Margin (SWIM), far-field sources on the Gloria fault and transoceanic tsunamis from the Caribbean region. SWIM and Gloria source areas were responsible for tsunamigenic earthquakes that affected the coasts of NEA basin. The 1755.11.01 and the 1941.11.26 events remain the most well-known (historical and instrumental) tsunamis in these areas.

The SWIM area is the most active seismic area in the NEA basin. It WAS the place of several events in historical times, namely: the 60 B.C. tsunami which reported to flood Portugal and Galicia coasts and the 382 AD tsunami that impacted Portugal and the Atlantic coasts of Morocco and Spain. Recently, the 1969.02.28 earthquake triggered a small tsunami recorded in the tide-gauge network of the area. Among the historical events, of the SWIM region, the November, 1st, 1755 tsunami is probably the most destructive in the history of Europe.

The Gloria fault is a segment of the Eurasia-Nubia plate boundary. This is a large strike slip fault, located between 24W and 19W, with scarce seismic activity. Nonetheless, it is the location of several large earthquakes that caused tsunamis, namely the 1941.11.26 earthquake with a magnitude of 8.3 and the 7.9 magnitude earthquake of 1975.05.26. In 1941, the sea overtopped some beaches in the north coast of Portugal; during the 1975 event, eyewitness observations report the fast withdraw of the sea and the subsequent influx over the highest water mark. In this paper, we compute far-field and regional tsunami impact in the NEA Basin based on hydrodynamic simulations of two case studies representing the worst case scenarios for SWIM and Gloria. Both scenarios correspond to the largest earthquakes expected to occur along in these areas. These scenarios are consistent with the two past events of November, 1st, 1755 and of November, 24th, 1941.

We assess tsunami impact through the computation of wave height distribution maps and tsunami radiation pattern maps for the entire basin. For some selected sites we present high resolution inundation maps.

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