Geophysical Research Abstracts
Vol. 16, EGU2014-5962-1, 2014
EGU General Assembly 2014

Edge waves excited by underwater landslides : scenarios in the sea of Marmara

Mehmet Sinan Özeren (1), Nazmi Postacioglu (2), Umut Canlı (3), and Luca Gasperini (4)
(1) Istanbul Technical University, (2) Istanbul Technical University, (3) Istanbul Technical University, (4) ISMAR Bologna

In this work we quantify the travel distance of edge waves created by submarine landslide over slopes of finite length. Edge waves, if generated, can constitute severe coastal hazard because they can travel long distances along the shores. In the Sea of Marmara there are several submarine masses susceptible to slide in case of a big earthquake on the Main Marmara Fault and some damage scenarios might involve edge waves. The edge waves generated by landslide Tsunamis over slopes of infinite lenghts are recently studied by Sammarco and Renzi (Landslide tsunamis propagating along a plane beach, 2008, Journal of Fluid Mech.). However the infinite slope length assumption causes a perfect confinement of the waves over the coastal slope, thereby overestimating the edge wave damage. Because of this, in their work there is no alongshore length scale over which these waves can lose their energy. In the real worls, the off-shore limiting depth will be finite and the off-shore direction wave vector will not be completely complex, pointing to radiation damping of these edge waves. In this work we analytically quantify the amount of this damping and we estimate the travel distance of the edge waves along the shoreline as a function of the limiting depth. We examine some some scenarios in the north coast of the Sea of Marmara and the northern shelf to quantify the edge waves. Since the method does not require high-resolution numerical computing, it can be used to calculate the edge-wave related risk factor anywhere with submarine landslide risk.