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Economic losses to buildings due to tsunami impact: the case of Rhodes city, Greece

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The expected economic losses to buildings due to the tsunami impact is of particular importance for the tsunami risk management. However, only few efforts can be found in this direction. In this study we approached this issue selecting the city of Rhodes Isl., Greece, as a test-site. The methodological steps followed include (a) selection of worst case scenario in the study area based on the tsunami history of the area which includes several powerful events, e.g. 142 AD, 1303, 1481, 1609, 1741, (b) numerical simulation of the tsunami and determination of the inundation zone, (c) application of the DAMASCHE empirical tool, produced by the SCHEMA EU-FP6 project, for the calculation of the damage level expected at each one of the buildings as a function of the water depth in the inundation area, (d) calculation of the buildings that would need reparation after partial damage and of those that would need reconstruction after total destruction, (e) calculation of the cost implied for both reparation and reconstruction. The several data sets which are needed for the execution of these steps, are susceptible to uncertainties and, therefore, the final results are quite sensitive to changes of the data sets. Alternative costs were calculated by taking into account the several uncertainties involved. This research is a contribution to the EU-FP7 tsunami research project ASTARTE (Assessment, Strategy And Risk Reduction for Tsunamis in Europe), grant agreement no: 603839, 2013-10-30.