



The 1969 St. Vincent Cape earthquake ($M_s=8.1$): synthetic seismograms and its application to the seismic hazard for the Ibero-Maghrebian region

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Cape St. Vincent is a region of great seismological interest due to the occurrence of the great 1755 Lisbon earthquake and its tectonic complexity. This earthquake can repeat with catastrophic consequences in the near regions of the Iberian Peninsula and Morocco. The last large shock in this area occurred on 28 February 1969 ($M_s=8.1$) and was recorded by analogical instruments which are in great part saturated. This fact and the lack of large earthquakes in this area recorded by modern Broad-Band instruments limits the possibilities of seismic hazard studies for the region. In order to solve this problem, we have generated synthetic seismograms at regional distances for a similar shock as that of 1969 using two different methodologies. First we have used the well studied earthquakes of lower magnitudes occurred in this region on 2007 ($M_w=5.9$) and 2009 ($M_w=5.5$) to test the Earth model used to generate synthetic records at regional distances and have used the E3D code and the EGF (Empirical Green Function) methodology to generate synthetic seismograms for the 1969 earthquake. Second we have generated synthetic PGA values for 1969 earthquake and check them with the observed PGA value at a site in Lisbon. We have determined PGV values and we have obtained the predicted instrumental intensity values IMM in the Iberian Peninsula according to Wald et al. (1999) relations. Comparison of these values with the observed intensities for the 1969 earthquake allows to validate these relations for large earthquakes in the region.