ELECTRONIC SUPPLEMENTARY MATERIAL FOR THE PAPER

Effect of shallow slip amplification uncertainty on probabilistic tsunami hazard analysis in subduction zones: use of long-term balanced stochastic slip models.

Scala A.1,2, Lorito S.2, Romano F.2, Murphy S.3, Selva J.4, Basili R.2, Babeyko A.5, Herrero A.5, Hoechner A.5, Løvholt F.6, Maesano F. E.2, Perfetti P.4, Tiberti M. M.2, Tonini R.2, Volpe M.7, Davies G.7, Festa G.4, Power W.8, Piatanesi A.2, Cirella A.2

1 Department of Physics “Ettore Pancini”, University of Naples, Italy. Email: scala@fisica.unina.it; antonio.scala@ingv.it;
2 Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Roma 1, Rome, Italy
3 Ifremer, Plouzané, France
4 Istituto Nazionale di Geofisica e Vulcanologia, Sezione di Bologna, Bologna, Italy
5 GFZ, Postdam, Germany
6 NGI, Oslo, Norway
7 Geoscience Australia, Canberra, Australia
8 GNS Science, Lower Hutt, New Zealand
Fig. ESM 1: Meshes of the seismogenic portion of the subduction structures used as case study. Panels (a)-(b)-(c) refer to the Calabrian, Hellenic and Cyprus arc respectively. The color scale defines the average depth of each cell expressed in km.
Fig. ESM 2: Number of modelled slip distributions rupturing within each cell on the Calabrian Arc for three different magnitude bins. Panels (a)-(b)-(c) refer to $M_w = 8.3$; 8.5 and 8.6 respectively. The panels show that for each magnitude bin the number of events generating slip at the different cells is pretty uniform with a tapering towards the edge.
Fig. ESM 3: Illustration of the slip distribution used for small magnitudes. On the left and example of homogeneous slip distribution for the depth-independent set. On the right and example of $SWF_h$-based slip distribution for the depth dependent set.
Fig. ESM 4: Estimate of the normalized $\delta_n$ for the depth-independent set obtained from the eq. (7) in the main text considering $P(\mathcal{S}_l|\mathcal{M}_w) = 1/N_{M_w}$. 

$\hat{\delta}_n$ is the normalized $\delta_n$.
Fig. ESM 5: For a single seismic slip distribution on the Calabrian arc: (a) original initial conditions computed from the slip distribution and (b) their reconstruction through the use of a linear combination of Gaussian elementary displacements. (c) Map of the residual between the original and the reconstructed initial conditions. Relatively to the same slip distribution: (d-g-j) the original and reconstructed mareograms, (e-h-k) the residuals between the two mareograms, and (f-i-l) the filtered mareograms overlapped to the reconstructed ones are plotted for three POIs located on the Peloponnesus, Cyprus and Calabrian coast respectively.
Fig. ESM 6: For a single seismic slip distribution on the Hellenic arc: (a) original initial conditions computed from the slip distribution and (b) their reconstruction through the use of a linear combination of Gaussian elementary displacements. (c) Map of the residual between the original and the reconstructed initial conditions. Relatively to the same slip distribution: (d-g-j) the original and reconstructed mareograms, (e-h-k) the residuals between the two mareograms, and (f-i-l) the filtered mareograms overlapped to the reconstructed ones are plotted for three POIs located on the Peloponnesus, Cyprus and Calabrian coast respectively.