Supporting Information for

Neotectonics and long-term seismicity in Europe and the Mediterranean region

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Introduction

This supporting information provides:

a) 12 files (Figures S1 to S12) showing long-term (non-elastic) horizontal velocities, fault heave rates, SHmax azimuths, and permanent strain rates for Western Mediterranean, Central Mediterranean, and Eastern Mediterranean.

b) 3 essential files used to generate the preferred model presented in the text of the paper (Data Set S1, Data Set S2, and Data Set S3);

c) 1 file describing the preferred model (Data Set S4);

d) 4 files predicting gridded long-term seismicity (in SI units of events/square-meter/s) above magnitude 6, 6.5, ,7, and 8 for the area with longitude -24°/35° and latitude 30°/52° (Data Set S5, Data Set S6, Data Set S7, Data Set S8)

e) 1 file containing outlines of regions where we compared predicted earthquakes respect to observed ones.
Figure S1. Western Mediterranean long-term horizontal velocity field (black arrows). The GPS scoring dataset (white arrows with the black error ellipse) is from Nocquet [2012].
Figure S2. Central Mediterranean long-term horizontal velocity field (black arrows). The GPS scoring dataset (white arrows with the black error ellipse) is from Nocquet [2012].
Figure S3. Eastern Mediterranean long-term horizontal velocity field (black arrows). The GPS scoring dataset (white arrows with the black error ellipse) is from Nocquet [2012].
**Figure S4.** Western Mediterranean. Fault element heave rates (colored ribbons in units of mm/a). The ribbon-scale is chosen to graphically show the kinematics of fault elements. Printed numbers are not averaged over the whole fault length and refer only to the corresponding fault element.
**Figure S5.** Central Mediterranean. Fault element heave rates (colored ribbons in units of mm/a). The ribbon-scale is chosen to graphically show the kinematics of fault elements. Printed numbers are not averaged over the whole fault length and refer only to the corresponding fault element.
Figure S6. Eastern Mediterranean. Fault heave rates (colored ribbons with values in mm/a). The ribbon-scale is chosen to graphically show the kinematics of fault elements. Printed numbers are not averaged over the whole fault length and refer only to the corresponding fault element.
Figure S7. Western Mediterranean. The common logarithm of the magnitude of the (permanent) principal strain rate with the greatest absolute value (in units of 1/s). This figure does not include the strain associated with fault slip rates previously shown in Figures S4.
Figure S8. Central Mediterranean. The common logarithm of the magnitude of the (permanent) principal strain rate with the greatest absolute value (in units of 1/s). This figure does not include the strain associated with fault slip rates previously shown in Figures S5.
Figure S9. Eastern Mediterranean. The common logarithm of the magnitude of the (permanent) principal strain rate with the greatest absolute value (in units of 1/s). This figure does not include the strain associated with fault slip rates previously shown in Figures S6.
Figure S10. Western Mediterranean. Predicted stress azimuths (SHmax) shown as colored bars, assumed to be parallel to the most compressive horizontal strain-rates, from the preferred model. Scoring dataset (white bars) obtained interpolating the World Stress Map, Release 2008 [Heidbach et al., 2008]. Interpolation performed using SHINE (available at shine.rm.ingv.it ; Carafa et al., 2015) setting searching radius to 180 Km, minimum cluster number as 3 and 90% confidence bounds as 45°.
Figure S11. Central Mediterranean. Predicted stress azimuths (SHmax) shown as colored bars, assumed to be parallel to the most compressive horizontal strain-rates, from the preferred model. Scoring dataset obtained interpolating the World Stress Map, Release 2008 [Heidbach et al., 2008] (white bars). Interpolation performed using SHINE (available at shine.rm.ingv.it ; Carafa et al., 2015) setting searching radius to 180 Km, minimum cluster number as 3 and 90% confidence bounds as 45°.
Figure S12. Eastern Mediterranean. Predicted stress azimuths (SHmax) shown as colored bars, assumed to be parallel to the most compressive horizontal strain-rates, from the preferred model. Scoring dataset obtained interpolating the World Stress Map, Release 2008 [Heidbach et al., 2008] (white bars). Interpolation performed using SHINE (available at shine.rm.ingv.it; Carafa et al., 2015) setting searching radius to 180 Km, minimum cluster number as 3 and 90% confidence bounds as 45°.
**Data Set S1.** This file defines plates at global scale. This plate subdivision overlaps the one described by Bird [2003] except for the greater Mediterranean area, as we explain in Section 2. For details on the file format: [http://peterbird.name/guide/dig_format.htm](http://peterbird.name/guide/dig_format.htm)

**Data Set S2.** This file contains the finite-element grid. It represents a two-layered lithosphere, including faults of the study area. Refer to Chapter 3 for details about grid construction. For each node, the values given in SI units are longitude (degrees East), latitude (degrees North), elevation, heat-flow, crustal thickness, mantle lithosphere thickness, density anomaly of compositional origin, and geothermal curvature due to transient cooling. To visualize this grid you will need to use the program OrbWin, available from [http://peterbird.name/oldFTP/OrbWin/](http://peterbird.name/oldFTP/OrbWin/)

**Data Set S3.** This file defines the resulting model of heat flow as described in Sub-Section 4.4. Locally, heat flow maps were used in preference to our default estimation algorithms to obtain the final values listed in Data Set 2.

**Data Set S4.** This file defines the long-term (permanent) horizontal velocities of the preferred model. To visualize this file you will need to use it jointly with Data Set S2 in the program FiniteMap, available from: [http://peterbird.name/oldFTP/FiniteMap/](http://peterbird.name/oldFTP/FiniteMap/)

**Data Set S5.** This file defines a regular (longitude, latitude) grid of numbers that are seismicity rates for magnitude M>6. For details on the format of this file: [http://peterbird.name/guide/grd_format.htm](http://peterbird.name/guide/grd_format.htm) To visualize this grid you will need to use the program NeoKineMap, available from: [http://peterbird.name/oldFTP/NeoKineMap/](http://peterbird.name/oldFTP/NeoKineMap/)

**Data Set S6.** This file defines a regular (longitude, latitude) grid of numbers that are seismicity rates (for magnitude M>6.5). For details on the format of this file: [http://peterbird.name/guide/grd_format.htm](http://peterbird.name/guide/grd_format.htm) To visualize this grid you will need to use the program NeoKineMap, available from: [http://peterbird.name/oldFTP/NeoKineMap/](http://peterbird.name/oldFTP/NeoKineMap/)

**Data Set S7.** This file defines a regular (longitude, latitude) grid of numbers that are seismicity rates (for magnitude M>7). For details on the format of this file: [http://peterbird.name/guide/grd_format.htm](http://peterbird.name/guide/grd_format.htm) To visualize this grid you will need to use the program NeoKineMap, available from: [http://peterbird.name/oldFTP/NeoKineMap/](http://peterbird.name/oldFTP/NeoKineMap/)
**Data Set S8.** This file defines a regular (longitude, latitude) grid of numbers that are seismicity rates (for magnitude M>8). For details on the format of this file: [http://peterbird.name/guide/qrd_format.htm](http://peterbird.name/guide/qrd_format.htm). To visualize this grid you will need to use the program NeoKineMap, available from: [http://peterbird.name/oldFTP/NeoKineMap/](http://peterbird.name/oldFTP/NeoKineMap/)

**Data Set S9.** This file defines the outlines of regions listen in Table 2. For details on this file format: [http://peterbird.name/guide/dig_format.htm](http://peterbird.name/guide/dig_format.htm).

**References**

