Supplementary Material for:  
The 1804 Alborán seismic series: search for the source

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# S1. Translation from Spanish of Murphy Corella (2019)’s work on the 1804 Alborán earthquake

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| Site | IEMS-98 | Earthquake effects |
| Motril | VII-VIII | Part of the building stock was damaged and part was left in ruins. Two casualties. Sea withdrawal of 22 varas (~18 m). The population left their houses for the main square in fear. The different seismic phases are described as follows: first, a strong shaking with perpendicular movement; 14-16 seconds later, trepidation for 4-5 seconds; after that, a strong undulating movement for more than 20 seconds. Total shaking lasted for 40-42 seconds. 11 aftershocks are described in the following days. |
| Almegíjar | VII | Town hall was destroyed. |
| Dalías | VI+ | Four churches and several private buildings were damaged, the population left their houses and camped outside town in fear. Shaking lasted for 50 seconds. Damage was repaired more than a month afterwards. |
| Berja |
| Adra | VI+ | Shaking lasted for 110 seconds. The population left their houses for the streets and squares in fear. Some buildings were damaged. |
| Roquetas | VI+ | The ceiling of the lye storehouse was razed. |
| Almería | VI+ | Generalized damage to the whole building stock. Shaking lasted for 30 seconds. No casualties. |
| Málaga | VI | Population left their houses for the streets and squares in fear. |
| Gibraltar | V | Shaken furniture inside the houses, loss of balance from standing people. |

**Table S1.** Translation from Spanish of earthquake effects reports for different sites studied by Murphy Corella, (2019) and the intensity values he initially assigned to each site.

# S2. Failed Boxer calculations

The boxer has been calculated using the Boxer software (Gasperini et al., 1999, 2010) calibrated with Gomez-Capera et al. (2014)’s coefficients for the Betics region.

The boxer calculated with Gasperini’s method is presented as a red rectangle in Figure S1. The boxer has an area of 81 km2 and strikes N93ºE. The computed epicenter is located at 36.7499ºN, 3.2436ºW, which is 38 km away from the epicenter proposed by Molina et al. (2018) and 83 km away from the one proposed by Martínez Solares & Mezcua Rodríguez (2002). Magnitude estimated by Boxer is Mw 5.88±0.10, which is lower than both Mw 6.3 assigned by Mezcua et al. (2013) and Posadas et al. (2006) and Mw 6.7 calculated by Martínez Solares & Mezcua Rodríguez (2002).

**Figure S1.** Boxer calculation result and known active faults in the area. Molina18: epicenter located by Molina et al. (2018). IGN02: epicenter located by Martínez Solares & Mezcua Rodríguez (2002). AIF: Al-Idrissi Fault. AF: Adra Fault. AvF: Averroes Fault. BF: Balanegra Fault. CF: Carboneras Fault. DF: Djibouti Fault. LLAF: Llano del Águila Fault. LVF: Loma del Viento Fault. NSF: North-South Faults. PEF: Punta Entinas Fault.

# Calendario El contenido generado por IA puede ser incorrecto.S3. Failed seismic scenarios with Campbell & Bozorgnia (2014)’s GMM and Worden et al. (2012)’s GMICE

**Figure S2**. Seismic scenarios built for candidate ruptures A1 and A2 (Adra Fault) and AI1 and AI2 (Al-Idrissi Fault) with the Campbell & Bozorgnia (2014) GMM. The dots correspond to the observed intensity data. Both the simulated scenario and the observed intensity data points are in the same color palette.

**Gráfico, Calendario, Mapa

El contenido generado por IA puede ser incorrecto.Figure S3.** Seismic scenarios built for candidate ruptures AV1 and AV2 (Averroes Fault) and C1 to C3 (Carboneras Fault) with the Campbell & Bozorgnia (2014) GMM. The dots correspond to the observed intensity data. Both the simulated scenario and the observed intensity data points are in the same color palette.

**Interfaz de usuario gráfica, Calendario

El contenido generado por IA puede ser incorrecto.Figure S4.** Seismic scenarios built for candidate ruptures B (Balanegra Fault), D1 and D2 (Djibouti Fault), and LV1 and LV2 (Loma del Viento Fault) with the Campbell & Bozorgnia (2014) GMM. The dots correspond to the observed intensity data. Both the simulated scenario and the observed intensity data points are in the same color palette.

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