

Supplementary Material

for

The September 27th, 2021, earthquake in central Crete (Greece). Detailed analysis of the earthquake sequence and indications for contemporary arc-parallel extension at the Hellenic arc

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Section S1: Additional tables and figures

Table S1. Fault plane solutions for the mainshock of the 2021 Arkalochori sequence, as determined by different agencies.

Source	Latitude (°N)	Longitude (°E)	Centroid Depth (km)	M _w	Strike (°)	Dip (°)	Rake (°)
NOA	35.12	25.26	6	5.9	195	59	-95
SL-NKUA	35.14	25.27	14	5.9	185	66	-97
GCMT	35.12	25.18	12	5.9	213	46	-96
USGS	34.95	25.15	12	6.0	215	35	-106
GFZ	35.18	25.25	16	6.0	218	57	-85
INGV	35.10	25.18	10	6.0	230	41	-68
IPGP	35.25	25.26	6	6.0	229	55	-75
OCA	35.13	25.26	6	6.0	225	70	-90
KOERI	35.12	25.21	10	6.0	207	50	-101
ERD	35.39	25.35	11	5.9	225	44	-83
CPPT	35.34	24.76	16	6.0	239	28	-55

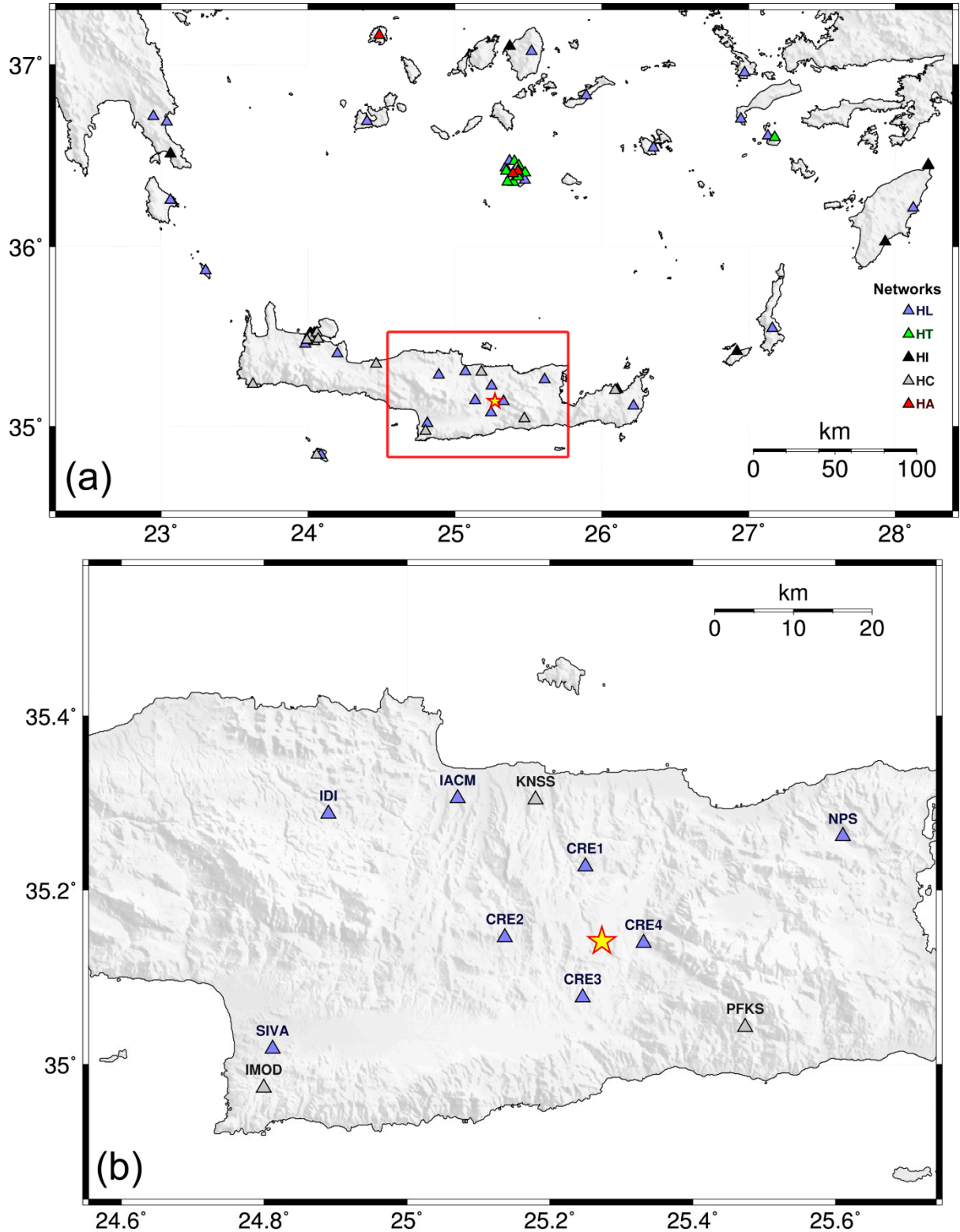


Figure S1. Seismological and accelerometric stations of the Hellenic Unified Seismological Network (HUSN) with available data during the study period (June 1st – October 18th, 2021). (a) Stations in the broader area of Southern Greece, (b) zoom in the area marked with a red rectangle in panel (a), showing stations at distances less than 60 km from the epicenter of the September 27th, 2021, mainshock at Arkalochori, Central Crete, marked with a star. See References [50,51,87–89] for information on the networks shown on the map.

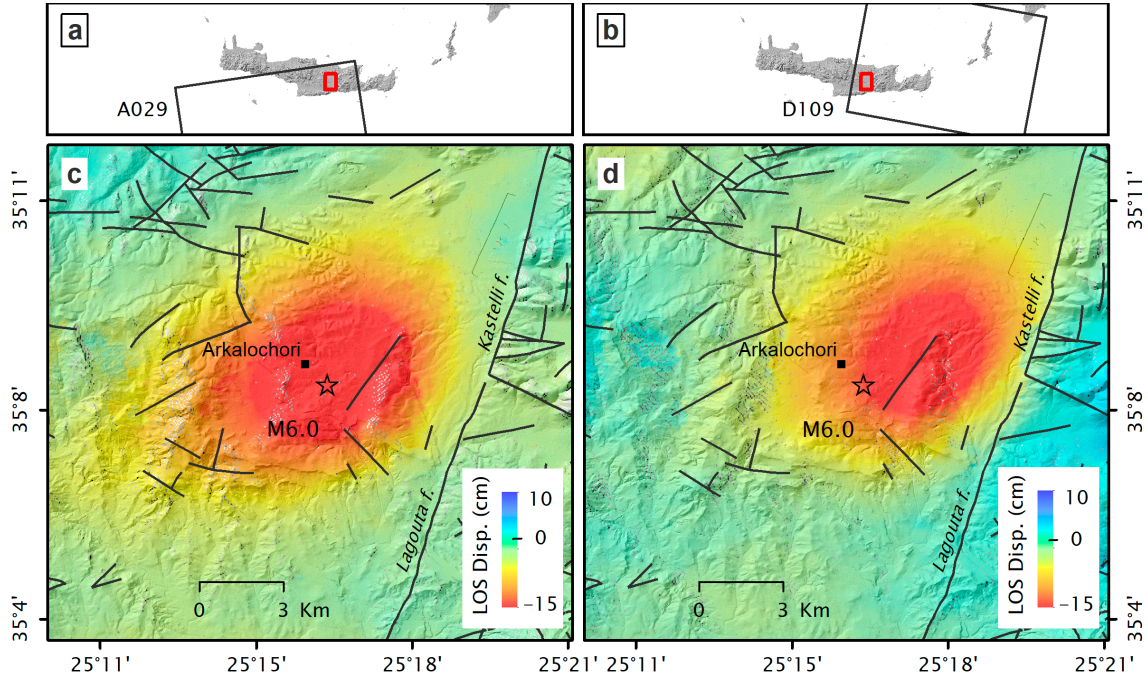


Figure S2. Co-seismic LoS displacement maps, as derived using GEP DIAPASON service, for ascending track A029 (18/09/2021-30/09/2021) and descending D109 (24/09/2021-30/10/2021) (c, d). The spatial extent of Sentinel-1 acquisition frames for both geometries are also indicated (a, b). Black lines correspond to faults (after [3]). The relocated epicenter of the September 27th, 2021, mainshock is marked with a star.

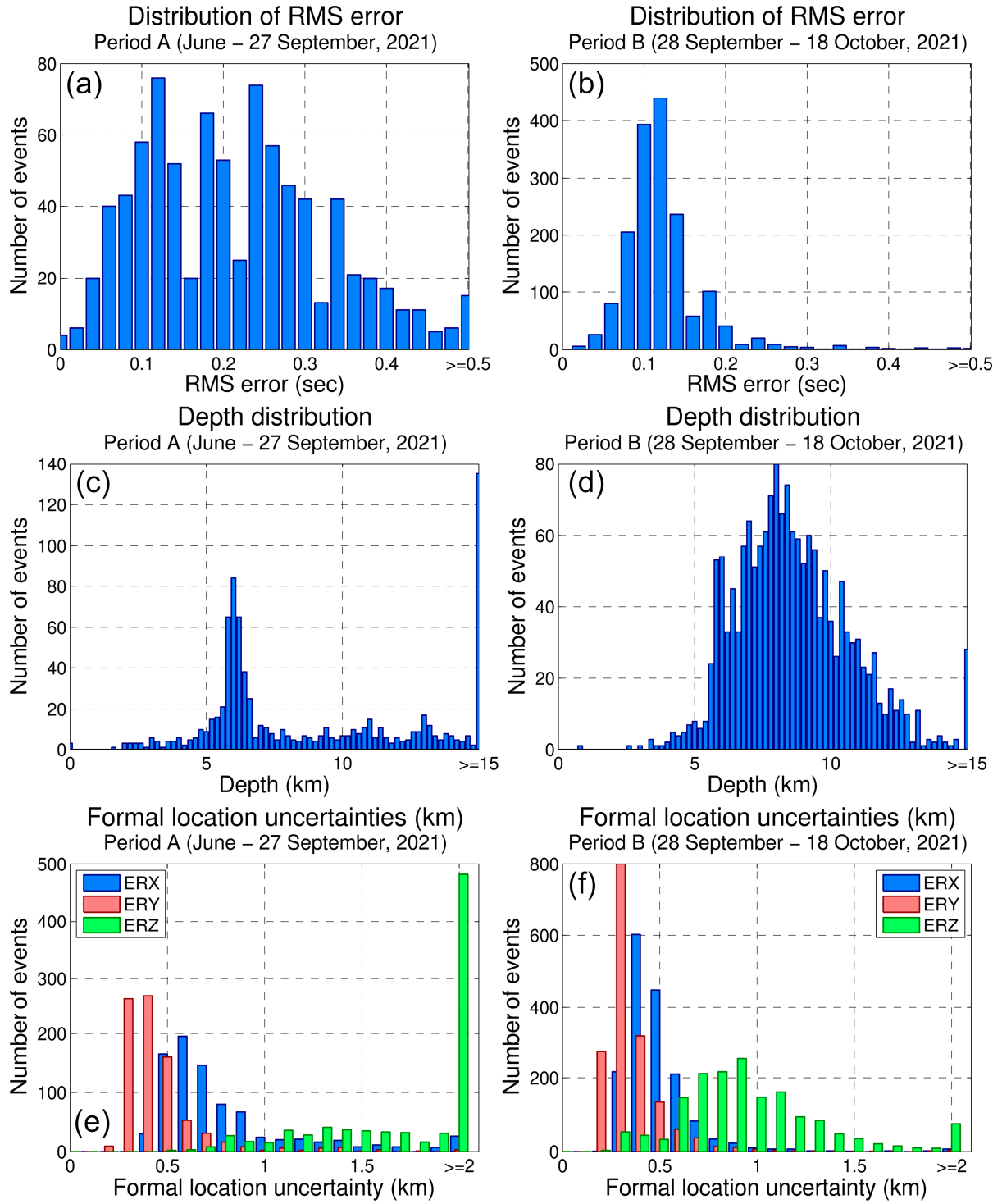


Figure S3. Initial location statistics (as reported by HypoInverse). (a, b) RMS travel-time residuals, (c, d) focal depth, (e, f) horizontal (ERX, ERY) and vertical (ERZ) formal location uncertainties, (a, c, e) for Period A, between June 1st and September 27th, 2021, and (b, d, f) for Period B, between September 28th and October 18th, 2021.

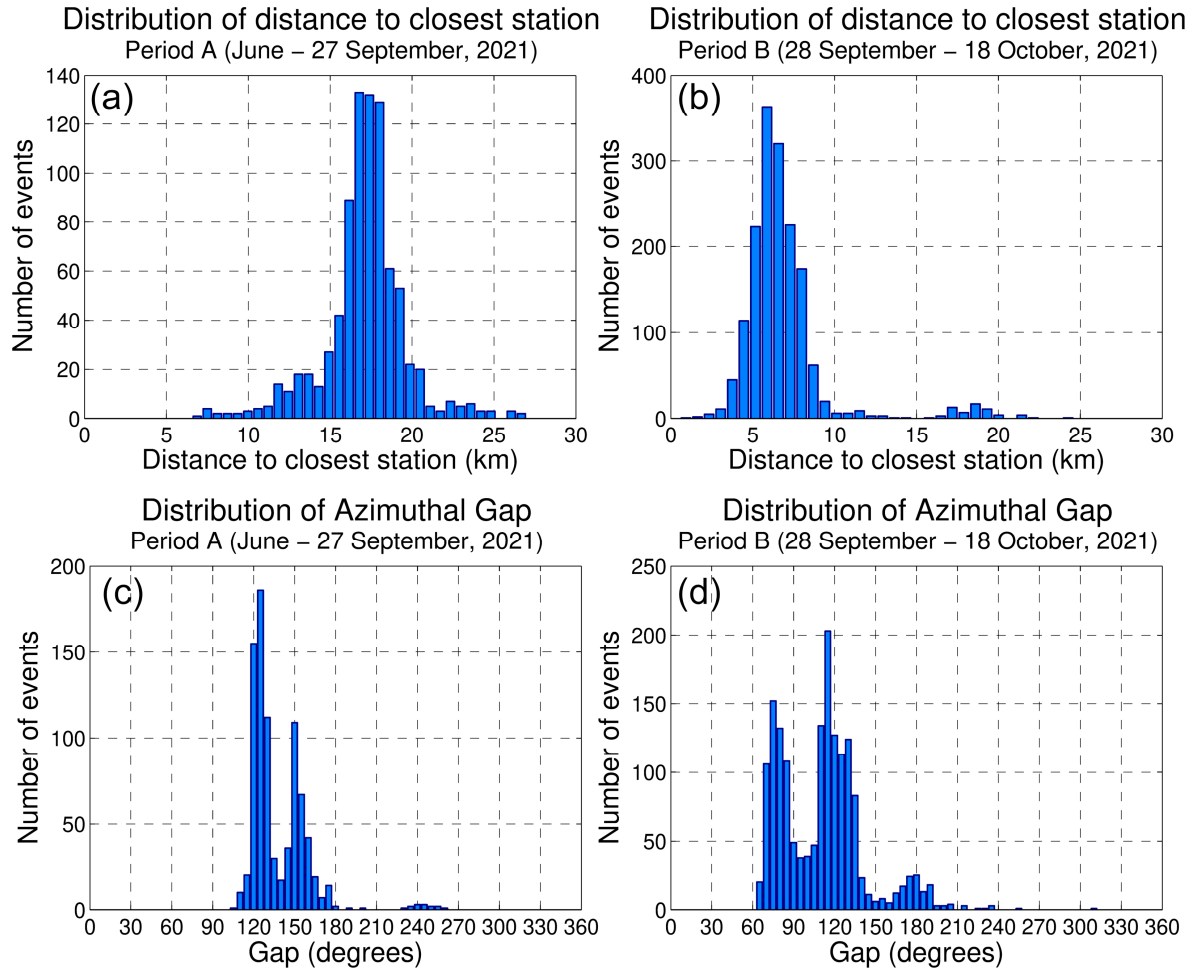


Figure S4. Initial location statistics. (a, b) Distribution of distance from the closest station with available data, (c, d) azimuthal gap, (a, c) for Period A, between June 1st and September 27th, 2021, and (b, d) for Period B, between September 28th and October 18th, 2021.

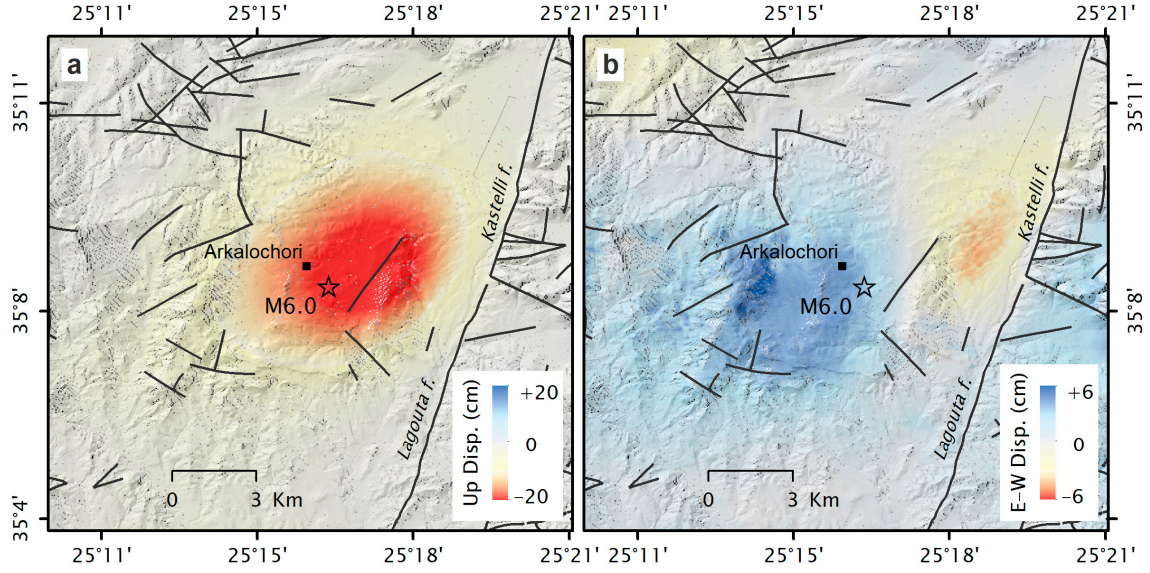


Figure S5. Vertical (a) and East-West (b) ground displacement maps as decomposed using Sentinel-1 DInSAR LoS observations from the ascending A029 and descending D109 tracks (see Table 1 in manuscript). Black lines correspond to faults (after [3]). The relocated epicenter of the September 27th 2021 mainshock is marked with a star.

Section S2: Relocated earthquake catalogue (June 1st – October 18th, 2021)

The relocated catalogue is available in the Excel file “E1_relocated_catalogue.xlsx”.

Column description:

- 1) event-code: identification code for each event, based on the origin time in yyyy-mm-dd-HH-MM-SS format, to facilitate temporal sorting.
 - 2-7) Year, Month, Day, Hour, Minute, Second of origin time.
 - 8) Latitude (°N).
 - 9) Longitude (°E).
 - 10) Focal Depth (km).
 - 11) Magnitude.
 - 12) Cluster ID: spatial group number (CLID).
 - 13) MinDist: Epicentral distance (km) of the closest station with available data.
- Uncertainties of initial locations, as reported by the HypoInverse location code:
- 14) RMS: Root mean square of the travel-time residual (sec)
 - 15-17) ERX, ERY, ERZ: absolute location uncertainties (km) on each of the three dimensions.
 - 18) Gap: azimuthal gap.
 - 19) Nsta: number of stations with available data.

