Supplementary Information

Aseismic transient during the 2010-2014 seismic swarm: evidence for longer recurrence of M≥6.5 earthquakes in the Pollino gap (Southern Italy)?

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1. Supplementary Methods

GPS processing strategy
We used the daily rinex files from permanent GPS stations in Southern Italy, most of which belong to the Rete Integrata Nazionale GPS network (RING1; available at http://ring.gm.ingv.it). Site coordinates of stations from RING and additional networks can be found in Table S1. GPS data are reduced using the Jet Propulsion Laboratory (JPL) GIPSY-OASIS II software (ver. 6.3) in a Precise Point Positioning mode applied to ionospheric-free carrier phase and pseudorange data2 and using JPL’s final fiducial-free GPS orbit products. We apply the VMF1 grids tropospheric mapping function3 and estimate tropospheric wet zenith delay and horizontal gradients as stochastic random-walk parameters every 5 min4, to model tropospheric refractivity. We compute the ocean loading from the FES2004 tidal model coefficients provided by the Ocean Tide Loading Provider5 (http://holt.oso.chalmers.se/loading) and apply it as a station motion model. Ambiguity resolution is applied using the wide lane and phase bias (WLPB) method6. In order to analyze and interpret station velocities relative to the Eurasia plate and to reduce the common mode signal, we updated the Eurasian terrestrial reference frame described in Métois et al.7. This frame is defined by 6 Cartesian coordinates and velocities for 132 stations selected by specific quality criteria. Our Eurasian frame is aligned in origin and scale with IGS088 and it is implemented to have no-net rotation with respect to the stable interior of the Eurasian plate, realized by a 32-station core subset. In order to emphasize the long-term, secular ~3mm/yr NE-SW directed active extension across the Apennines, crustal velocities (Fig. S1) and time series used for the inversion are rotated relative to the Apulian block (Table S2). GPS velocities and related uncertainties (Fig. S1) are obtained using the robust trend estimator MIDAS9. The MIDAS-estimated velocity is essentially the median of the distribution of values calculated using pairs of data in the time series separated by approximately 1 year, making it insensitive to seasonal variation and time series outliers.
MIDAS provides uncertainties based on the scaled median of absolute deviations of the residual dispersion. The uncertainties have been shown to be realistic and do not require further scaling. The high-rate GPS analysis strategy
In addition to the standard GPS processing strategy, we performed also a high-rate analysis of the GPS data at the two closest stations, MMNO and VIGG (Fig. S2). The high-rate GPS analysis strategy was performed by using the GIPSY-OASIS II software (ver. 6.3) released by Jet Propulsion Laboratory (JPL, http://gipsy-oasis.jpl.nasa.gov) and the JPLs final fiducial GPS orbits and high-rate (30 sec) clocks products. The analysis strategy performed in this study was mainly based on three steps: first, using the Global Pressure and Temperature (GPT2) troposphere refractivity function, a static solution with a 5-min sampling rate was performed to estimate the tropospheric dry and wet zenith delay and the horizontal gradients as stochastic random walk parameters; second, the dry troposphere contribution was extracted from the previous step and used, as well as the GPT2 mapping function, as input in the second static solution to improve the estimation of the wet troposphere zenith delay contribution; third, both the dry and wet troposphere contributions were used as input to estimate the station position epoch-by-epoch during the kinematic solution. For all the steps, the precise point positioning method was applied to ionosphere-free carrier phase and pseudorange data and a 2nd-order ionospheric correction was estimated by using the IRI ionospheric model. Ocean loading was also computed from the FES2004 tidal model coefficients delivered by the Ocean Tide Loading Provider at Chalmers University (http://holt.oso.chalmers.se/loading) to model station motion. Finally, absolute antenna calibration was used to improve the model of the GPS antennas and the ambiguity resolution was performed by using the wide-lane and phase bias (WLPB) method.

InSAR processing strategy
Interpretation of single interferograms encompassing the main shock generated during the seismic crisis was impaired by the presence of large atmospheric patterns that can be only handled by multi-temporal analysis carried out with Advanced Differential SAR Interferometry (ADInSAR) approaches. Data have been processed with a two-scale (A-DInSAR) approach whereby a sequence of processing steps were carried out at low resolution (small scale) and high resolution (large scale), respectively. The low resolution processing involved a Small Baseline Subset (SBAS) DInSAR processing algorithm as described in Fornaro et al., with a spatial resolution of about 50mx50m. This algorithm retrieved an estimation of the atmospheric propagation delay patterns as well as the deformation time series on a small spatial scale on almost the whole frame of 40Kmx40Km.
In all the CSK interferograms, topographic fringes were removed using the 1 arcsec resolution Shuttle Radar Topography Mission (SRTM) Digital Elevation Model. Moreover, a specific processing has been applied for the estimation and compensation on slowly temporally variable atmospheric components associated with seasonal stratified atmospheric components. The method, similar to that discussed in Fornaro et al., applies a filter that removes components that would not be captured by the standard spatially low-pass and temporally high-pass filtering of atmospheric patterns.
The signal component retrieved at low resolution were used to calibrate the data for the subsequent higher resolution analysis. The latter was carried out via a tomographic based approach which has been demonstrated to achieve improvements in the detection and estimation of topographic and motion parameters of persistent scatterers with respect to classical Persistent Scatterers Interferometry (PSI) methods.
The higher resolution processing benefited from a filtering method, named “Component extrAction and sElEction SAR (CAESAR)” which has been recently proposed and patented. CAESAR achieves a favorable tradeoff between the final resolution and the spatial density of monitored pixels. It exploits a covariance based analysis to extract dominant components and achieve a dramatic increase in the detection of persistent scatterers by slightly sacrificing the spatial resolution of the final image. Further details on the CAESAR method are given in Fornaro et al.\textsuperscript{15,16}: the final image has a resolution of 9mx9m, achieved averaging on a 3x3 box the full resolution CSK data with a very high density of monitored pixels, see Supplementary Fig. S4.

Before modeling, the DInSAR interferograms were downsampled using a resolution-based resampling algorithm\textsuperscript{17,18}. The resampling technique permits us to reduce the number of data points from several millions to a set of about some hundreds of points, with the highest density of data points close to the source of deformations.

**Time dependent inversion**

Geodetic time series contain several signals, related both to the steady tectonic motions and to the transient motions. Time dependent inversions were performed with TDEFNODE\textsuperscript{19}. In the TDEFNODE approach the parameters describing the steady motions are estimated simultaneously with the transients. The long term constant (or steady state) geodetic surface velocities are estimated by finding the best fit slope for each time series individually. As regard, the distribution of transient slip on the fault, in TDEFNODE it can be represented in a number of ways. The approach does allow considering both for uniform slip faults and distributed slip on discrete nodes, as well as simple functions describing the spatial distributions of slip on the fault. The slip rate, \( s \), on the fault during an event is described by:

\[
s(x, w, t) = A \cdot X(x) \cdot W(w) \cdot S(t)
\]

where \( X(x) \cdot W(w) \) is the spatial dependence, and \( x \) is along-strike position on the fault, \( w \) is the down-dip position, \( t \) is time and \( A \) is the amplitude. The time dependence, \( S(t) \), of the slow slip event can be set to an impulse, a Gaussian function, a box-car function or a series of overlapping triangles as is done for earthquake time functions\textsuperscript{20}. The surface displacement history is found by integrating \( S(t) \) over time and by applying the appropriate Green’s functions. In TDEFNODE the inversions were done with a combination of grid search and simulated annealing. The quantity that is minimized is the sum of the reduced chi-square of the weighted misfit residuals plus any penalties (i.e., penalties that are assessed for exceeding parameter bounds). Parameter uncertainties are estimated by a linearization at the best fit parameter values, and for this reason are likely underestimated.

Here, we used a total of 87772 observations (63972 observations are the ENU component position of the GPS time series, while 23,800 observations are the LOS displacements) and a time history comprising overlapping triangles. In this case, the free parameters for the time history are \( T_0 \), the origin time, and the triangle amplitudes \( A_i \) (where \( i \) is the number of triangles in the time function and \( A_i \) is given in mm/yr). The aseismic slow slip transient event was represented by an origin time, 24 triangular time function elements, one slip amplitude and fault dimensions (length and width), fault strike, dip and rake and position. The resulting chi-square of the misfit residuals is 2.04, suggesting that the observation uncertainties are slightly underestimated or that a uniform slip fault model is a too simple model to explain the observed deformation.
Slip distribution inversion
The input data set for the inversion are the horizontal cumulative displacements observed at 12 GPS sites (Table T4) and the cumulative CSK interferogram (Fig. S7g). To test variable slip on the fault plane, the best fit fault was discretized into smaller patches of 1 x 1 km. We extended the fault from the surface to a depth of about 15 km in order to capture the entire area affected by the swarm sequence and the concentric displacement pattern revealed in the DinSAR interferograms, and to allow for down dip and along strike slip. We computed the Green’s functions, which relate unit slip on individual fault patches to surface displacements at individual points using rectangular dislocations in an elastic, homogeneous, and isotropic half space. The inversion was carried out using a bounded-values, weighted least squares inversion algorithm to impose a nonnegative constraint on the estimated slip allowing unbounded values for InSAR orbital parameters (that is, offset and ramp), and using a Laplacian smoothing operator to avoid implausible slip distribution.

Stress transfer
It is well established that stress transfer after a slip episode (both coseismic and aseismic slip) may load or discharge adjacent structures. It is therefore important to identify which other possible faults in the Pollino seismic gap area that may have been brought closer to failure by the stress changes following the mixed coseismic/aseismic transient slip episode occurred during the 2010-2014 Pollino swarm sequence. For this reason, we calculate the stress changes due to our best-fit model of the aseismic slip on the northern and southern normal faults in the region (ME, CPST and PF faults) using the Coulomb 3.1 code. We assume a dip of 50° and a rake of -90° for each fault and subdivide them into 2x2 km patches (fault dimension about 20x16 km for each fault, friction coefficient 0.4). Obviously, the largest stress increases are on the patches of the causative fault surrounding the area that is modelled as being affected by the aseismic slip during the swarm sequence (Fig. S8). On the southern PF fault, we find little increased stresses (about 0/0.2 bar) only in the north-western tip of the fault plane, whereas on the northern MF and CPST faults we find decreased stress (about -4/0.8 bar) on the two south-eastern halves of both the planes, and increased stresses (up to 1.5 bar) on their north-western parts. If we consider in the calculation the small patch of estimated aseismic slip from our variable slip model (located in the northern part of the extended fault plane), we find that stress is further decreased on the central parts of the northern faults. Since this feature might not be well resolved by our data, we suggest that the stress variation on the faults of the Pollino area is likely due only to the main patch of our estimated aseismic slip distribution.

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2. Supplementary Tables

Supplementary Table T1. Coordinates and velocities of continuous GPS station in southern Italy.
Coordinates, velocities (in Eurasia reference frame) and errors for each GPS station in Southern Italy processed and used for reference frame realization. Site name, latitude and longitude (in degrees), east and north component of the velocity and relative errors (in mm/yr), time of acquisition (start/end in decimal year), GPS network.

| Site  | Latitude  | Longitude  | Vel East (mm/yr) | Vel North (mm/yr) | Rel East (%) | Rel North (%) | Year Start | Year End |
|-------|-----------|------------|------------------|-------------------|--------------|--------------|------------|----------|
| ACCA  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| ACER  | 39.8103   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| ALBI  | 39.8155   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| AMUR  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| ANG1  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| ASA   | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| AV01  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| AV02  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| AV04  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| BELV  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| BISI  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |
| BULG  | 39.8333   | 12.64      | 3.70             | 3.20              | 0.25         | 0.21         | 2005.68    | 2016.09  |

Errors for each GPS station in southern Italy are provided as well.
Supplementary Table T2. Relative block angular velocities. Latitude and longitude (in degrees). $\Omega$ is the rotation rate in degrees/Ma (the first block rotates counter-clockwise relative to the second); $S_\Omega$ is the formal error (1-sigma confidence level).

| Block pair | Lat.    | Long.   | $\Omega$ | $S_\Omega$ |
|------------|---------|---------|----------|------------|
| Ap-Eu      | 36.418  | 33.552  | -0.163   | 0.020      |
Supplementary Table T3. CSK acquisition parameters in terms of temporal and spatial baselines. Record number, satellite, acquisition time (year/month/day), temporal baseline (in days), spatial baseline (in m). In bold the master image (T22).

| #   | Record Number | Sat ID | Acquisition Date | Temporal Baseline (days) | Spatial Baseline (m) |
|-----|---------------|--------|------------------|--------------------------|----------------------|
| T00 | 100803247     | CSKS4  | 2012/06/05       | -352                     | 449.370              |
| T01 | 100820263     | CSKS4  | 2012/07/23       | -304                     | 524.418              |
| T02 | 100826385     | CSKS4  | 2012/08/08       | -288                     | 250.959              |
| T03 | 100832190     | CSKS4  | 2012/08/24       | -272                     | 217.629              |
| T04 | 100849423     | CSKS4  | 2012/10/11       | -224                     | 296.055              |
| T05 | 100863640     | CSKS4  | 2012/11/12       | -192                     | -496.762             |
| T06 | 100871068     | CSKS1  | 2012/12/02       | -172                     | 975.786              |
| T07 | 100876223     | CSKS1  | 2012/12/18       | -156                     | 437.414              |
| T08 | 100878887     | CSKS2  | 2012/12/26       | -148                     | 512.200              |
| T09 | 100881523     | CSKS1  | 2013/01/03       | -140                     | -189.659             |
| T10 | 100884717     | CSKS2  | 2013/01/11       | -132                     | 146.171              |
| T11 | 100887321     | CSKS1  | 2013/01/19       | -124                     | 511.459              |
| T12 | 100890398     | CSKS2  | 2013/01/27       | -116                     | -196.854             |
| T13 | 100893762     | CSKS1  | 2013/02/04       | -108                     | 651.344              |
| T14 | 100897396     | CSKS2  | 2013/02/12       | -100                     | -201.600             |
| T15 | 100900278     | CSKS1  | 2013/02/20       | -92                      | -505.324             |
| T16 | 100903849     | CSKS2  | 2013/02/28       | -84                      | -374.943             |
| T17 | 100906577     | CSKS1  | 2013/03/08       | -76                      | 249.971              |
| T18 | 100914104     | CSKS1  | 2013/03/24       | -60                      | 278.830              |
| T19 | 100917848     | CSKS2  | 2013/04/01       | -52                      | -240.065             |
| T20 | 100926831     | CSKS4  | 2013/04/21       | -32                      | 370.487              |
| T21 | 100933226     | CSKS4  | 2013/05/07       | -16                      | -328.413             |
| T22 | 100939378     | CSKS4  | **2013/05/23**   | **0**                    | **0.00000**           |
| T23 | 100945665     | CSKS4  | 2013/06/08       | 16                       | -316.845             |
| T24 | 100952700     | CSKS4  | 2013/06/24       | 32                       | 480.136              |
| T25 | 100959341     | CSKS4  | 2013/07/10       | 48                       | -145.216             |
| T26 | 100965170     | CSKS4  | 2013/07/26       | 64                       | -407.433             |
| T27 | 100971809     | CSKS4  | 2013/08/11       | 80                       | 212.124              |
| T28 | 100979018     | CSKS4  | 2013/08/27       | 96                       | -366.143             |
| T29 | 101002511     | CSKS4  | 2013/10/14       | 144                      | -392.263             |
| T30 | 101008385     | CSKS4  | 2013/10/30       | 160                      | -240.787             |
| T31 | 101015207     | CSKS4  | 2013/11/15       | 176                      | 794.984              |
| T32 | 101022205     | CSKS4  | 2013/12/01       | 192                      | -129.480             |
| T33 | 101035864     | CSKS4  | 2014/01/02       | 224                      | -354.448             |
| T34 | 101042445     | CSKS4  | 2014/01/18       | 240                      | -293.915             |
| T35 | 101049126     | CSKS4  | 2014/02/03       | 256                      | -718.847             |
| T36 | 101055292     | CSKS4  | 2014/02/19       | 272                      | -550.822             |
| T37 | 101067171     | CSKS4  | 2014/03/23       | 304                      | -919.733             |
| T38 | 101074126     | CSKS4  | 2014/04/08       | 320                      | -462.669             |
Supplementary Table T4. Transient GPS displacements. Latitude and longitude (in degrees). $D_E$, $D_N$ are the east and north components of displacement in mm; $S_E$, $S_E$ are the formal error (1-sigma confidence level).

| GPS site | Lat.  | Long. | $D_E$ | $D_N$ | $S_E$ | $S_E$ |
|----------|-------|-------|-------|-------|-------|-------|
| AQSA     | 16.0839 | 39.7210 | -0.07 | 0.08  | 1.00  | 1.00  |
| CASV     | 16.2050 | 39.8100 | 0.63  | -0.02 | 1.00  | 1.00  |
| CAVI     | 16.2130 | 39.8150 | 0.70  | -0.02 | 1.00  | 1.00  |
| COLR     | 16.4220 | 40.1930 | 0.25  | 0.16  | 1.00  | 1.00  |
| CUCC     | 15.8169 | 39.9940 | -0.46 | -0.11 | 1.00  | 1.00  |
| DIMT     | 15.8220 | 39.6760 | -0.48 | -0.47 | 1.00  | 1.00  |
| MMNO     | 15.9720 | 39.8700 | -6.33 | -4.23 | 1.00  | 1.00  |
| PRAI     | 15.7799 | 39.8970 | -1.88 | -0.29 | 1.00  | 1.00  |
| SALB     | 16.3460 | 39.8770 | 0.71  | 0.07  | 1.00  | 1.00  |
| SCHR     | 16.0850 | 40.1900 | 0.14  | 0.05  | 1.00  | 1.00  |
| SENS     | 16.3120 | 40.1390 | 0.38  | 0.26  | 1.00  | 1.00  |
| VIGG     | 16.1160 | 39.9860 | 2.01  | 1.33  | 1.00  | 1.00  |

Supplementary Table T5. GPS velocities in Apulia reference frame. Latitude and longitude (in degrees). $V_E$, $V_N$ are the east and north components of velocity in mm/yr; $S_E$, $S_E$ are the formal error (1-sigma confidence level).

| GPS site | Lat.  | Long. | $V_E$ | $V_N$ | $S_E$ | $S_E$ |
|----------|-------|-------|-------|-------|-------|-------|
| AQSA     | 16.0839 | 39.7210 | -0.06 | -0.62 | 0.54  | 0.54  |
| CASV     | 16.2050 | 39.8100 | -0.47 | -0.75 | 0.42  | 0.42  |
| CAVI     | 16.2130 | 39.8150 | -0.63 | -0.70 | 0.52  | 0.52  |
| COLR     | 16.4220 | 40.1930 | -0.08 | 0.13  | 0.49  | 0.49  |
| CUCC     | 15.8169 | 39.9940 | -1.23 | -1.16 | 0.32  | 0.32  |
| DIMT     | 15.8220 | 39.6760 | -0.30 | -1.19 | 0.46  | 0.46  |
| MMNO     | 15.9720 | 39.8700 | -1.61 | -1.65 | 0.49  | 0.49  |
| PRAI     | 15.7799 | 39.8970 | -0.81 | -1.57 | 0.40  | 0.40  |
| SALB     | 16.3460 | 39.8770 | 0.30  | 0.01  | 0.40  | 0.40  |
| SCHR     | 16.0850 | 40.1900 | -0.33 | -0.50 | 0.32  | 0.32  |
| SENS     | 16.3120 | 40.1390 | 0.60  | -0.06 | 0.51  | 0.51  |
| VIGG     | 16.1160 | 39.9860 | 1.02  | 0.60  | 0.50  | 0.50  |
Supplementary Figure S1. GPS velocity field for the Pollino range and surrounding regions in an Apulia frame. Blue arrows are the horizontal velocity with error ellipses at 95% confidence interval. The red star is the 12 October 2012 $M_W$ 5.1 main shock of the 2010-2014 Pollino swarm sequence. Site used to define the rotation of the Apulia (Ap) microplate are shown with yellow squares. The dashed lines enclose the study area. The map was created by using Genetic Mapping Tools software (GMT v4.5.14; http://gmt.soest.hawaii.edu/)$^{27}$. 
Supplementary Figure S2. High-rate GPS analysis. Horizontal and vertical components of 5 Hz GPS record at stations MMNO and VIGG. The orange, blue and green trends represent the east, north and vertical components, respectively. The grey dashed lines represent the mean position pre- and after the event, while thin solid black lines are the predicted offsets by our modelling of the $M_W$ 5.1 event. Note that the predicted offsets are almost equal to zero. The red dashed line represents the time of the $M_W$ 5.1 earthquake. The figures were created by using Genetic Mapping Tools software (GMT v4.5.14; http://gmt.soest.hawaii.edu/).
Supplementary Figure S3. Spatial and temporal baseline distribution of the CSK data set. The data set starts on 6 June 2012 and includes about 2 years of deformation. The lines between the different acquisitions define the interferometric pairs used for the construction of the SBAS time series. Master image is at coordinates (0,0).
Supplementary Figure S4. Overlay of the deformation mean velocity of monitored scatterers to a Google Map image. Images ©2016 Google, Map data ©2016 Google.
Supplementary Figure S5. Geodetic time series and seismicity rate. (a) Orange, (b) blue and (c) green dots indicate the east, north and vertical displacements, respectively, recorded at GPS site MMNO expressed with respect to the Apulian (Ap) reference frame. (d) Comparison of line-of-sight projected GPS time series (yellow circles) and DInSAR CSK time series (purple triangles). (e) CSK time series of selected points (blue triangles) in the area of maximum deformation (i.e., between MMNO and VIGG sites). We also plot the number of earthquakes (grey bars) as a function of time. The red dashed line indicates the 25 October 2012 $M_W$ 5.1 main event of the swarm sequence, while the grey dashed lines show the main accelerations observed in the CSK time series (with labelled dates). The figures were created by using Genetic Mapping Tools software (GMT v4.5.14; http://gmt.soest.hawaii.edu/).
Supplementary Figure S6. Complete set of GPS time series. (a) AQSA station. (b) CASV. (c) CAVI. (d) COLR. (e) CUCC. (f) DIMT. (g) MMNO. (h) PRAI. (i) SALB. (j) SCHR. (k) SENS. (l) VIGG. GPS time series of all the sites used in the present study in an Apulia (Ap) reference frame, plotted with the distribution of seismicity. The circles (orange = E-component; blue = N-component; green = Up-component) are the daily positions, the solid grey curves the predicted positions by our preferred model, and the black dashed line the time of the 25 October 2012 $M_w$ 5.1 earthquake. The grey histograms show the seismicity rate. The figures were created by using Genetic Mapping Tools software (GMT v4.5.14; http://gmt.soest.hawaii.edu/)\textsuperscript{27}. 
Supplementary Figure S6. (continued)
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Supplementary Figure S7. Inverted InSAR interferograms. (a) T01-T05. (b) T06-T10. (c) T11-T15. (d) T16-T20. (e) T20-T25. (f) T25-T30. (g) T31-T35. Data (left panels), model (central panes), and residual (right panels) sampled points from all the unwrapped interferograms encompassing the Pollino swarm sequence from the CSK ascending track. The star indicates the location of the $M_W$ 5.1 earthquake. Other symbols as in Figure 1. See Supplementary Table T3 for acquisition times. The maps were created by using Genetic Mapping Tools software (GMT v4.5.14; http://gmt.soest.hawaii.edu/)\textsuperscript{27}. 

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Supplementary Figure S7. (continued)
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Supplementary Figure S8. Coulomb stress change resolved on faults surrounding the 2010-2014 Pollino swarm sequence due to the estimated mixed seismic/aseismic slip transient. (a) Change of Coulomb stress induced by the whole estimated aseismic slip; (b) change of Coulomb stress induced only by the main central patch of the estimated aseismic slip. The color range has been saturated at ±1 bar to highlight the stress changes on other faults (the maximum range is ±20 bar for patches on the fault of the modelled aseismic transient). MF, PF and CPST stand for Mercure, Pollino and Castelluccio Seluci-Timpa della Manca faults. The figure was created by using Coulomb software (Coulomb 3.1; https://earthquake.usgs.gov/research/software/coulomb/).