

Author Correction: Localized fault-zone dilatancy and surface inelasticity of the 2019 Ridgecrest earthquakes

Correction to: *Nature Geoscience* <https://doi.org/10.1038/s41561-020-0628-8>, published online 7 September 2020.

<https://doi.org/10.1038/s41561-022-01101-2>

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 Check for updates

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In the version of this article originally published, describing the location of the earthquakes using their Universal Transverse Mercator (UTM) coordinates introduced a bias in the inversion used to derive the two-dimensional (2D) strain fields, affecting the sign (positive versus negative) of the strain results.

An alternative approach that reduces this bias is to describe the locations of the individual measurements using locations relative to each other (order 10^0 – 10^1 m) by subtracting the coordinates of the geographic center of the strain cell from the measurement locations¹. The recalculated strain fields, which have been published online², differ from our originally published results in two principal ways. First, the near-fault strain region is characterized by both positive and negative dilatation, as opposed to strictly positive dilatation as originally reported. Similarly, the sign of shear strains is spatially varying with the azimuth of the rupture. These shear strain sign variations are expected given that we report shear strains relative to the geographic reference frame rather than the spatially varying fault strike reference frame. Second, the permanent fault zone width we described from both dilatational and shear strains does not change within uncertainty from our originally reported values; however, the spread of reported values is wider.

The article text has been updated with the new median, 16th, and 84th percentile values of the permanent fault zone width described by dilatation and shear strains, respectively, which are $32 \text{ m}^{+50\text{m}}_{-21\text{m}}$ and $23 \text{ m}^{+29\text{m}}_{-12\text{m}}$, as compared to $31 \text{ m}^{+17\text{m}}_{-8\text{m}}$ and $25 \text{ m}^{+11\text{m}}_{-10\text{m}}$ reported in the originally published article, “Strain-field characteristics” subsection, first paragraph. In the beginning of the same paragraph, the text “The entire surface rupture of both earthquakes is characterized by positive dilatation, indicating that the surface rupture zone dilated (expanded) during co-seismic rupture” has been corrected to “The surface rupture of both earthquakes is characterized by both positive and negative dilatation, indicating that the surface rupture zone dilated (expanded) and contracted during co-seismic rupture.” The change in sign of the strain field does not affect our conclusions that the permanent strain zone is relatively narrow and uniform along the rupture, or that the strain zone width is invariant of off-fault deformation, surface geology or across-fault displacement magnitude. Fig. 2a and Extended Data Fig. 3 have been updated to reflect the change in sign of the dilatational strain component when imposing the new strain inversion approach; original and updated figures are shown below. The changes are reflected in the HTML and PDF versions of the article.

References

1. Cheng, G. & Barnhart, W. D. Permanent co-seismic deformation of the 2013 Mw7.7 Baluchistan, Pakistan earthquake from high-resolution surface strain analysis. *J. Geophys. Res. Solid Earth* **126**, e2020JB020622 (2021).
2. Barnhart, W. D., Gold, R. D., and Hollingsworth, J. Displacement and strain field from the 2019 Ridgecrest earthquakes derived from analysis of WorldView optical satellite imagery (ver. 2.0, May 2021): U.S. Geological Survey data release, <https://doi.org/10.5066/P9QRZ6NR> (2020).

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Corrections & amendments

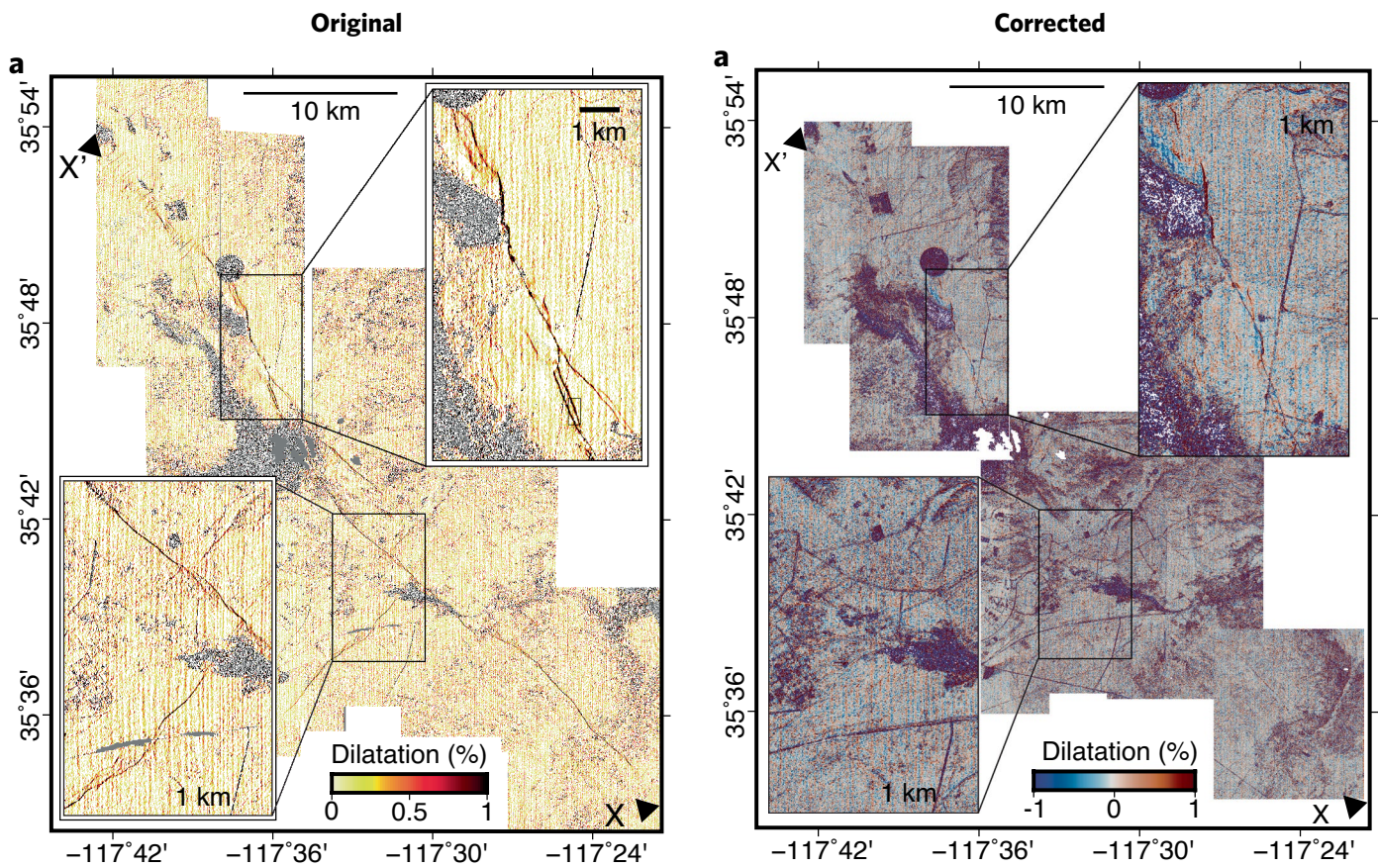


Fig. 1 | Original and corrected Fig. 2a.

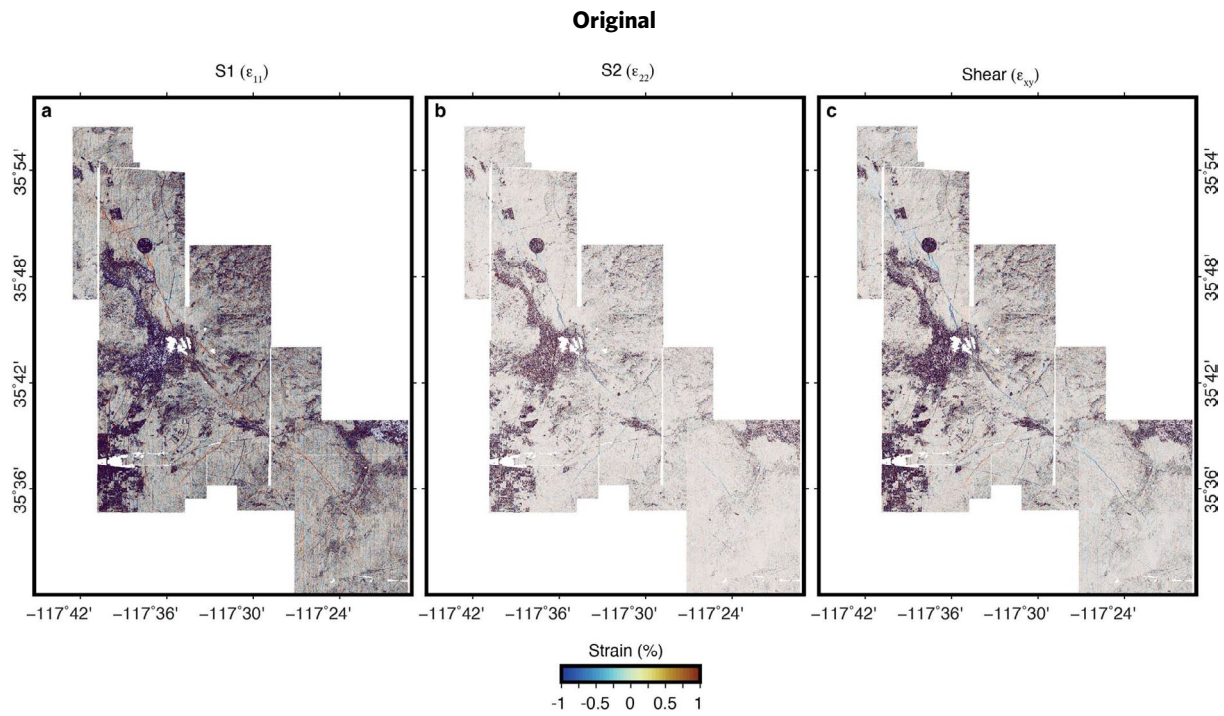


Fig. 2 | Original Extended Data Fig. 3.

Corrections & amendments

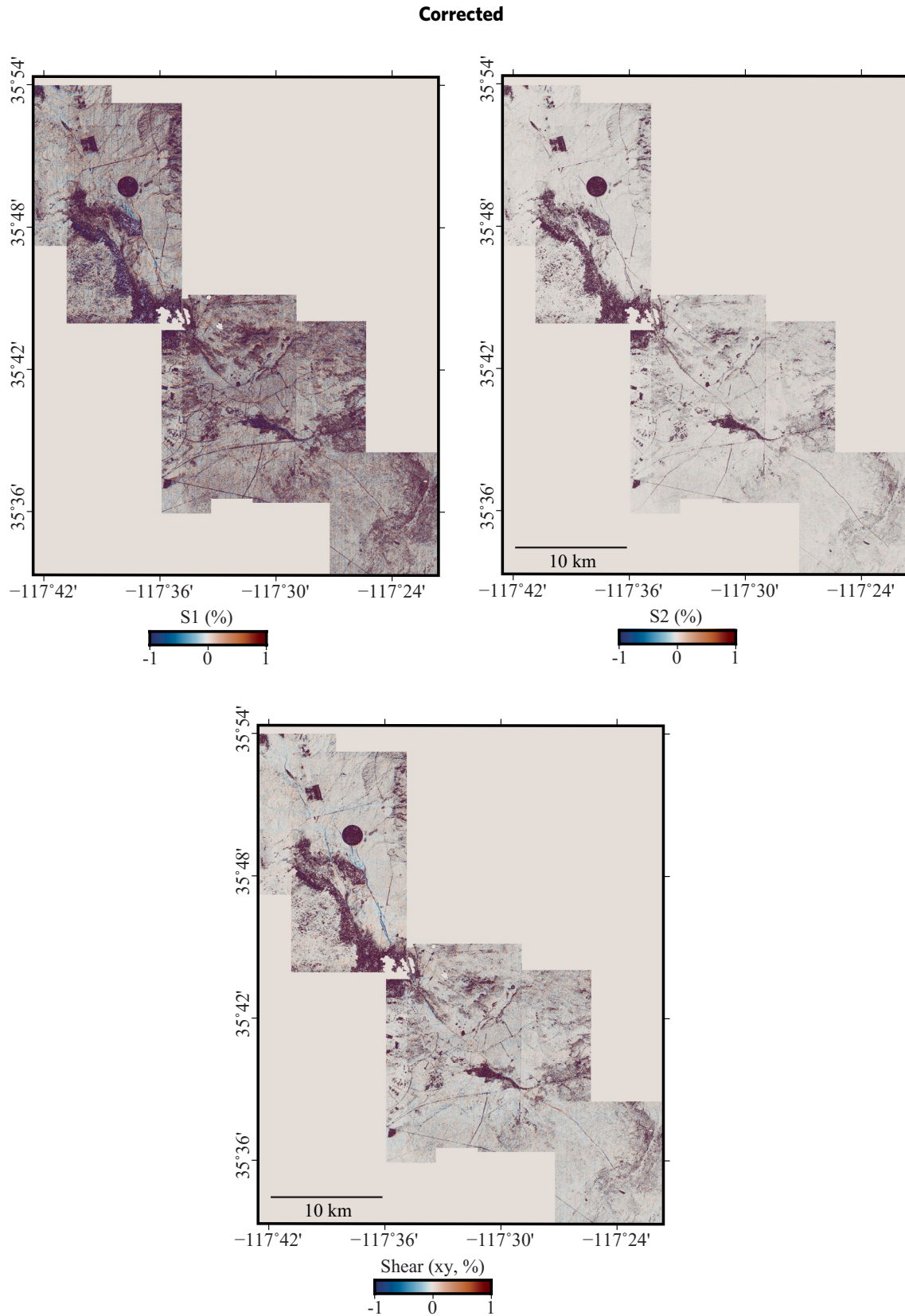


Fig. 3 | Corrected Extended Data Fig. 3.