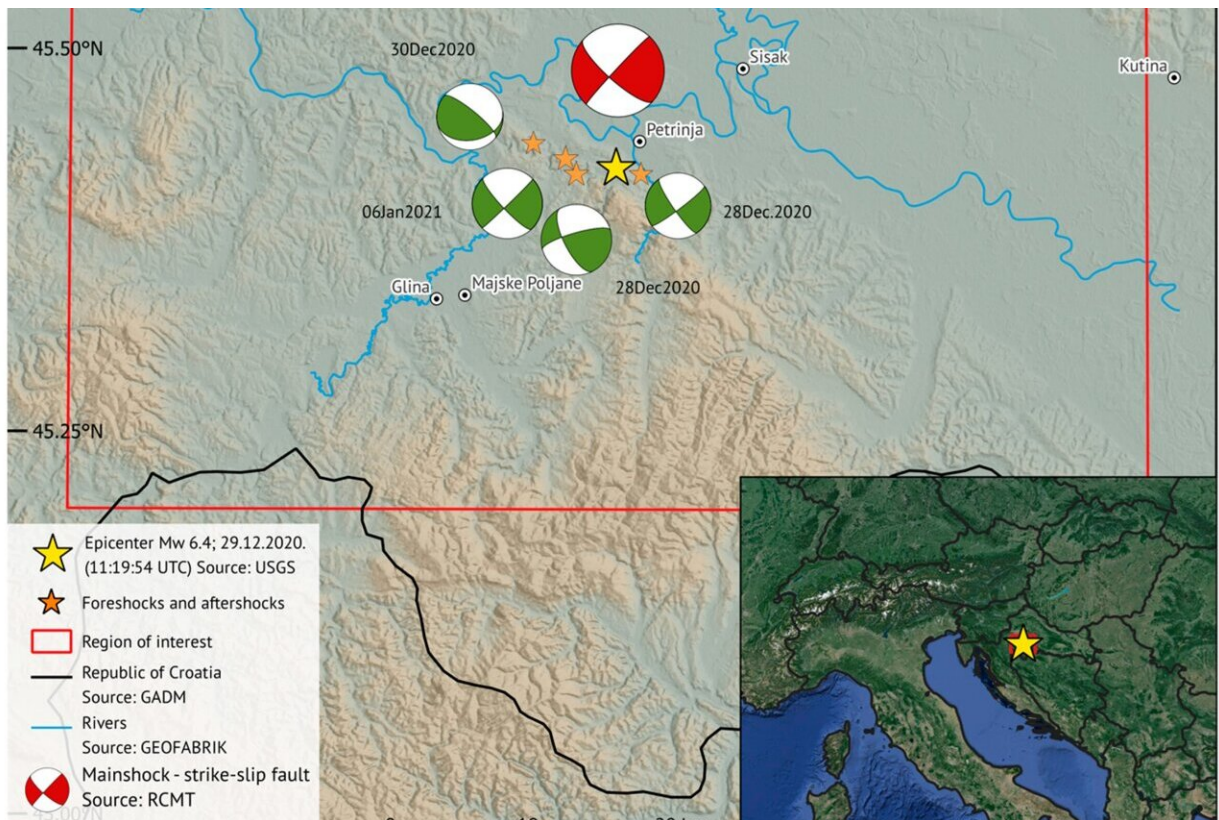


Study shows magnitude of displacements by December 2020 Petrinja earthquake

June 24 2024



Location of the study area and coverage of Sentinel-1 SAR data in the Petrinja region. Credit: *Remote Sensing* (2024). DOI: 10.3390/rs16122112

The December 2020 earthquake near the Croatian town of Petrinja (magnitude 6.4) was felt in all Croatia and in many places in the

neighboring countries, and caused serious damage at the site. A recent Croatian-Hungarian collaboration has analyzed the horizontal and vertical displacements caused by the quake and placed them in a regional geodynamic interpretation frame.

The displacements caused by the Petrinja quake have already been estimated in several previous works. The new results are methodologically novel in that they use an unprecedented amount of geodetic data to reconstruct three-dimensional motions. In addition to the InSAR data (from Copernicus Sentinel-1 mission), data from three hundred re-occupying GNSS stations of lower-order trigonometric and GNSS networks were processed.

The [results](#), appearing in *Remote Sensing*, showed that the magnitude of horizontal displacements in the epicenter of the [earthquake](#) was 40 centimeters in some places, with a maximum of 20 centimeters in the vertical direction.

The last earthquake of this magnitude in the region was the one in Zagreb in 1880. In the 140 years between the two quakes, the horizontal displacement of the region today, measured by GPS stations, of 2–4 millimeters per year—a local manifestation of plate tectonics—would cause a displacement on the order of the displacement observed in the recent quake.

This suggests that displacements due to global tectonics and plate movements in the Petrinja-Zagreb region are realized mostly by individual events, earthquakes, rather than continuous movement.

This is important information not only for Croatia when assessing earthquake safety, but also for the neighboring areas.

More information: Marko Pavasović et al, The Largest Geodetic

Coseismic Assessment of the 2020 Mw = 6.4 Petrinja Earthquake,
(2024). [DOI: 10.3390/rs16122112](https://doi.org/10.3390/rs16122112)

Provided by Eötvös Loránd University

Citation: Study shows magnitude of displacements by December 2020 Petrinja earthquake
(2024, June 24) retrieved 29 June 2024 from <https://phys.org/news/2024-06-magnitude-displacements-december-petrinja-earthquake.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.