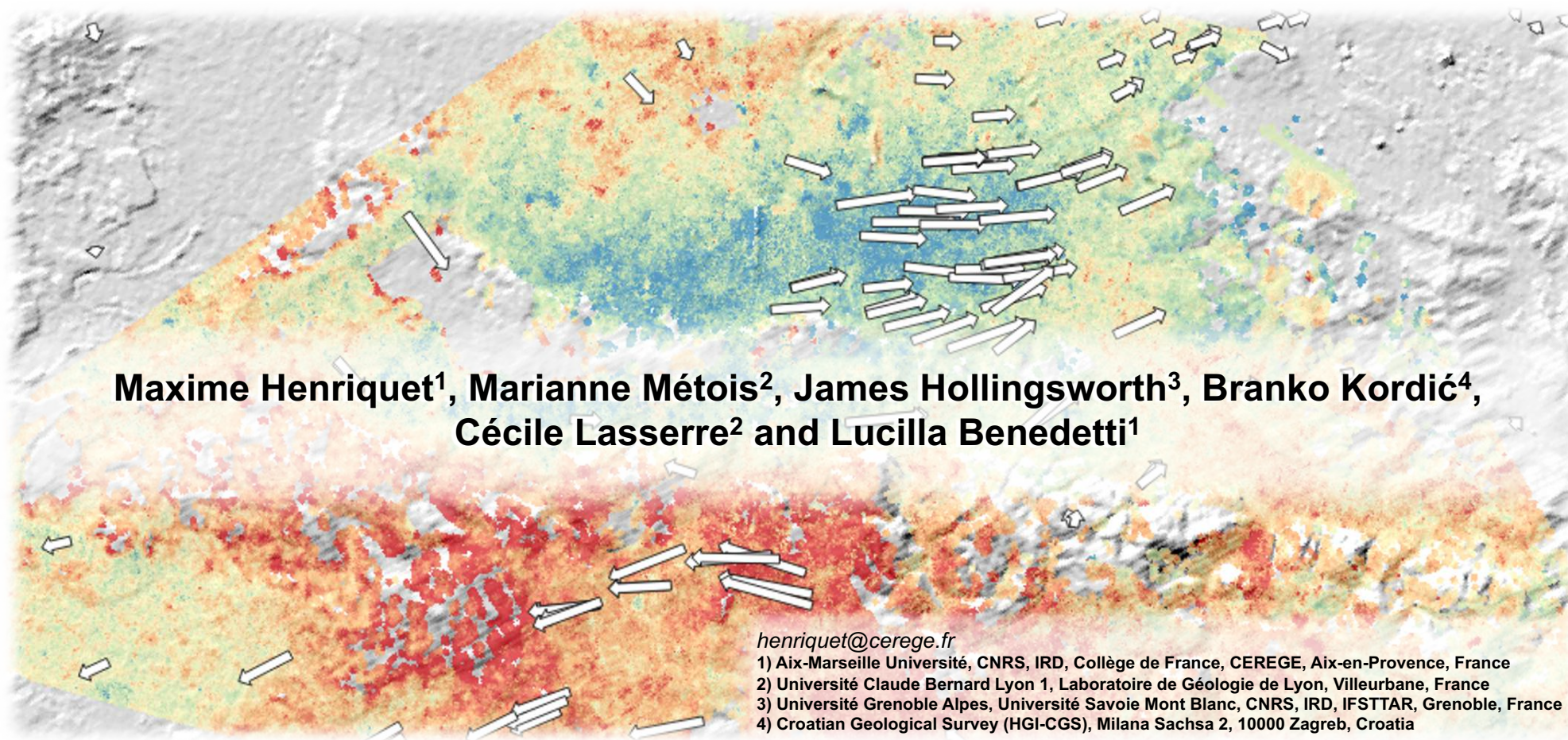
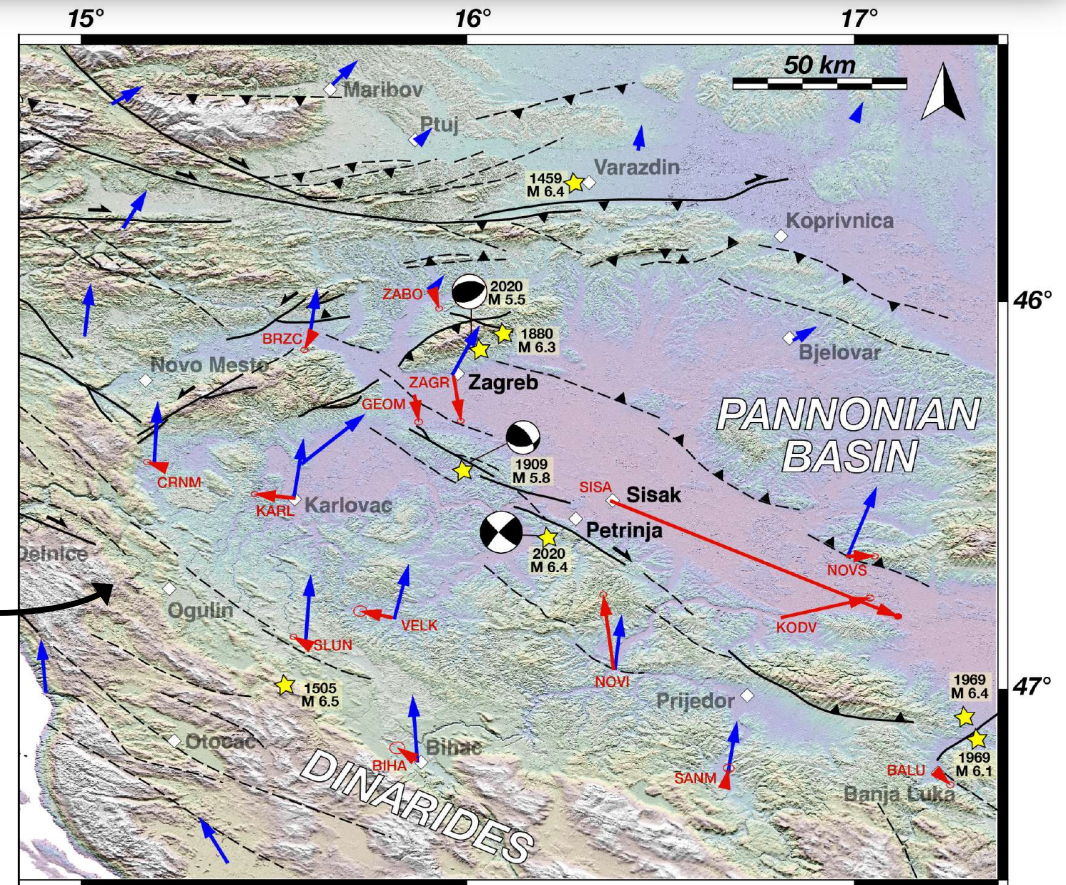
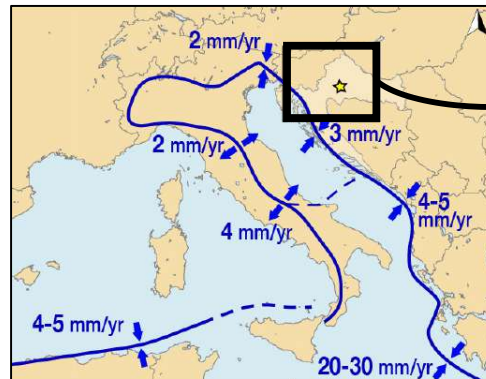




Slip distribution of the 29 December 2020 Mw 6.4 Petrinja earthquake (Croatia) from dense geodetic benchmarks and optical image correlation measurements



- Among the largest **continental earthquakes** in Europe for decades
- **Right-lateral** transpressive Petrinja-Pokupsko fault
- **Surface ruptures** over ~13 km, **strong damages**



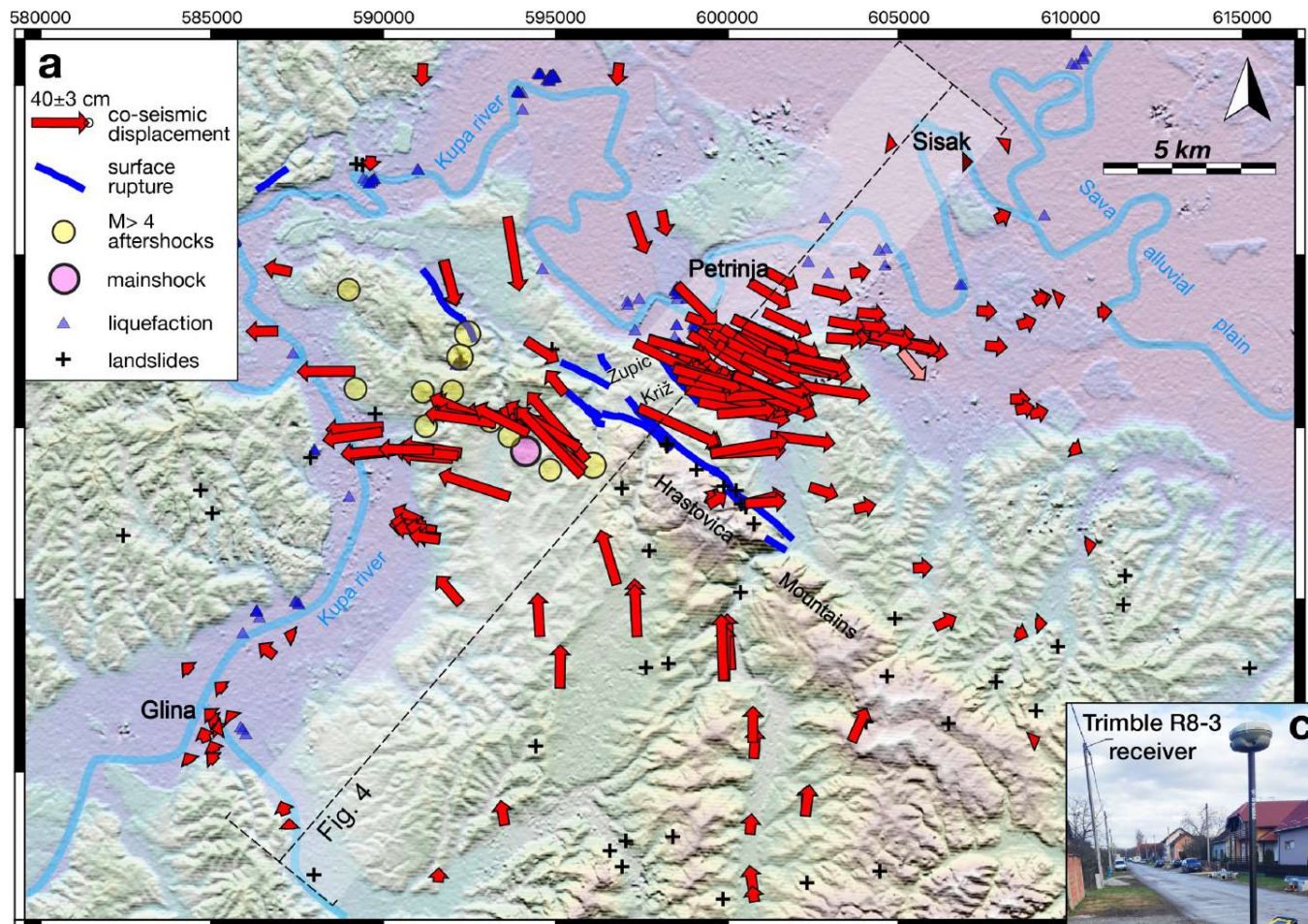
→ 2 mm/yr (inter-seismic, CEGRN data) — Active faults ★ Historical earthquakes
→ 10±0.5 mm (co-seismic, this study) - - - Potentially active faults

Low strain contexts =
sparse seismic monitoring + rare
occurrence of strong earthquakes

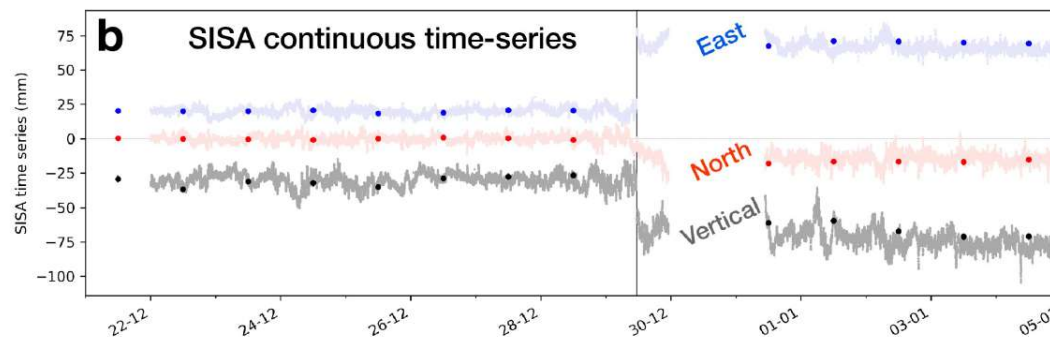
⇒ **Few detailed analysis of the slip
distribution for such ruptures**

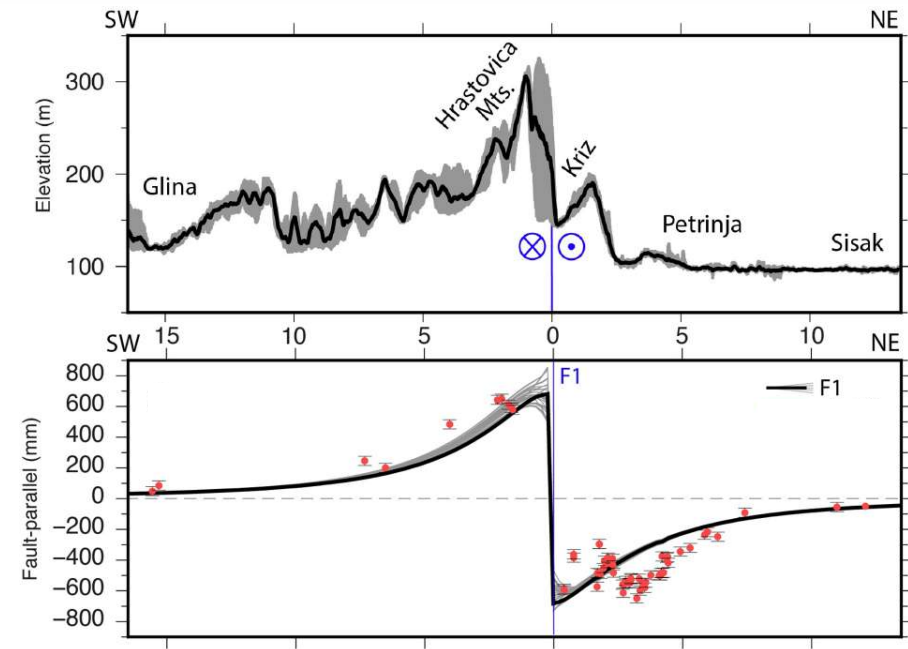
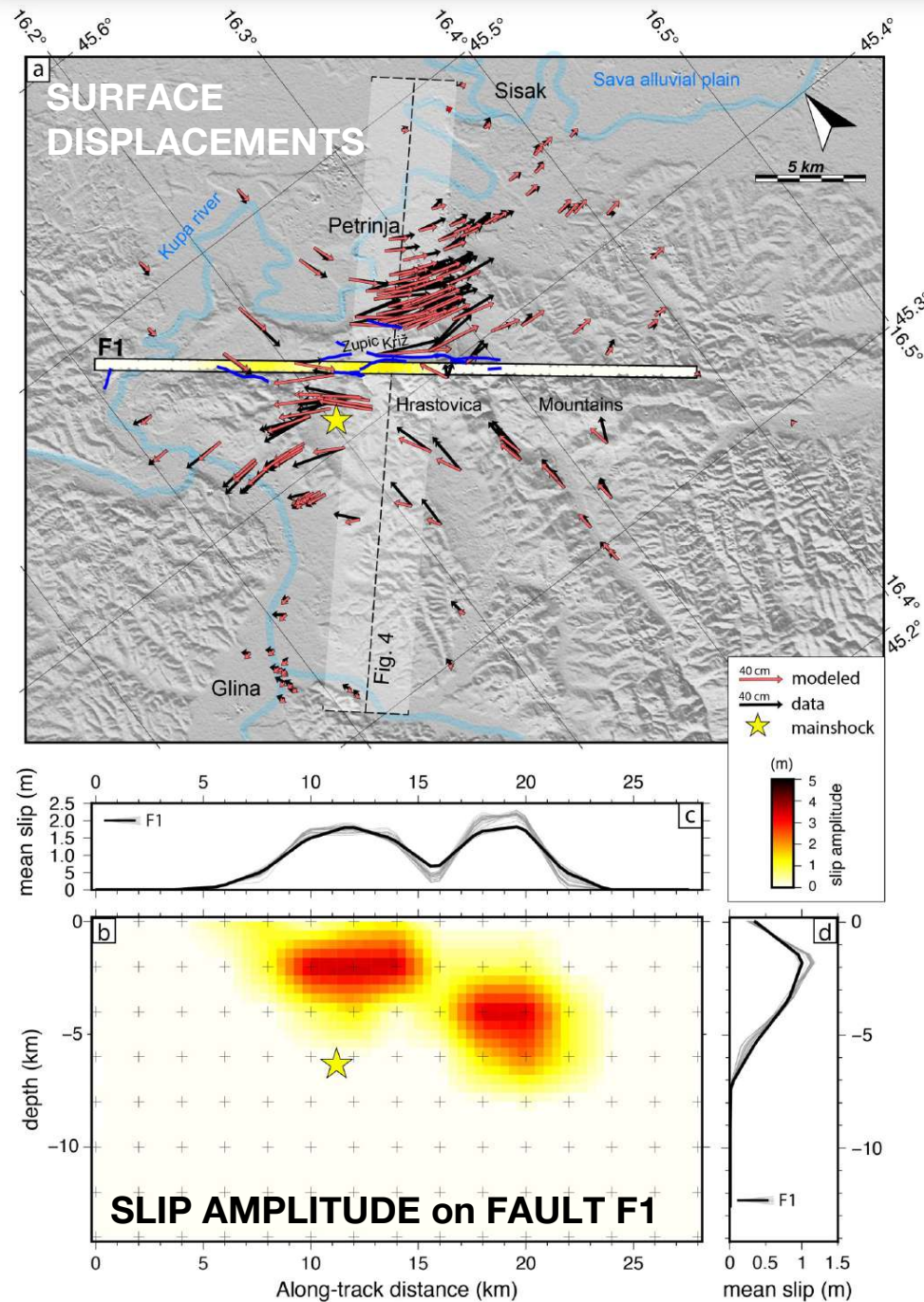


Baize et al., 2022

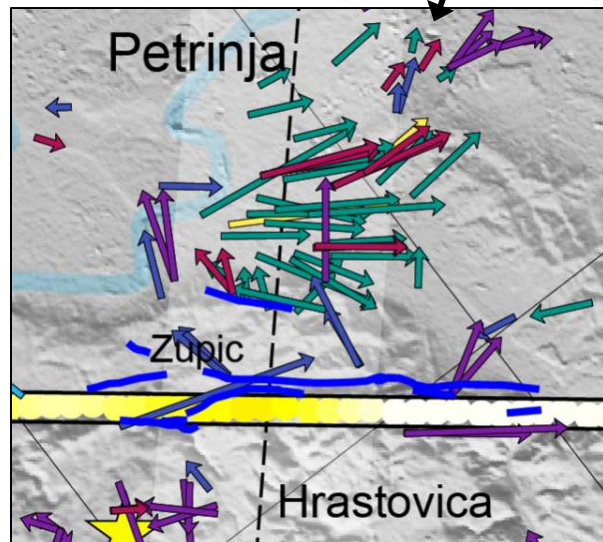
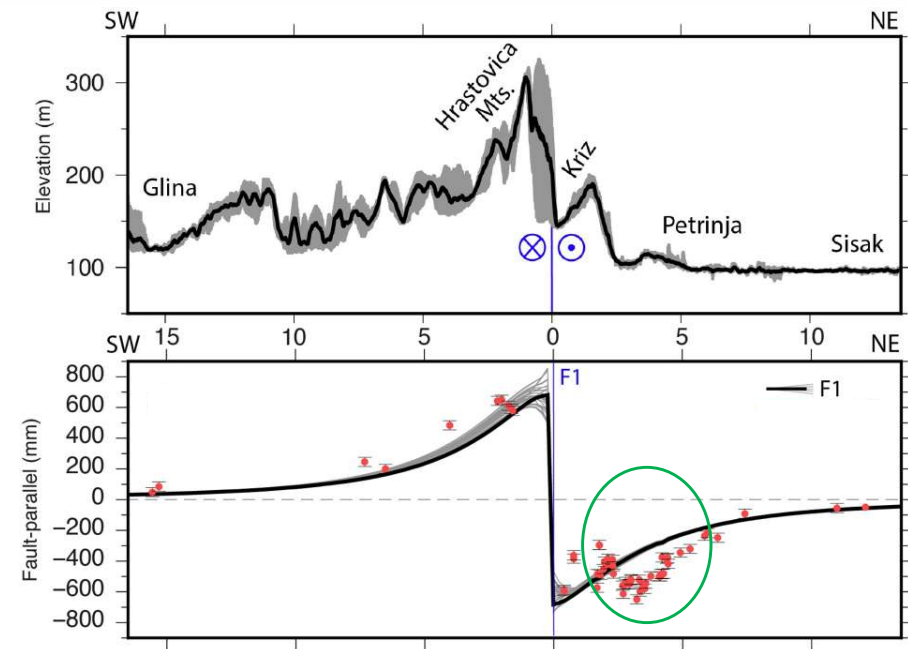
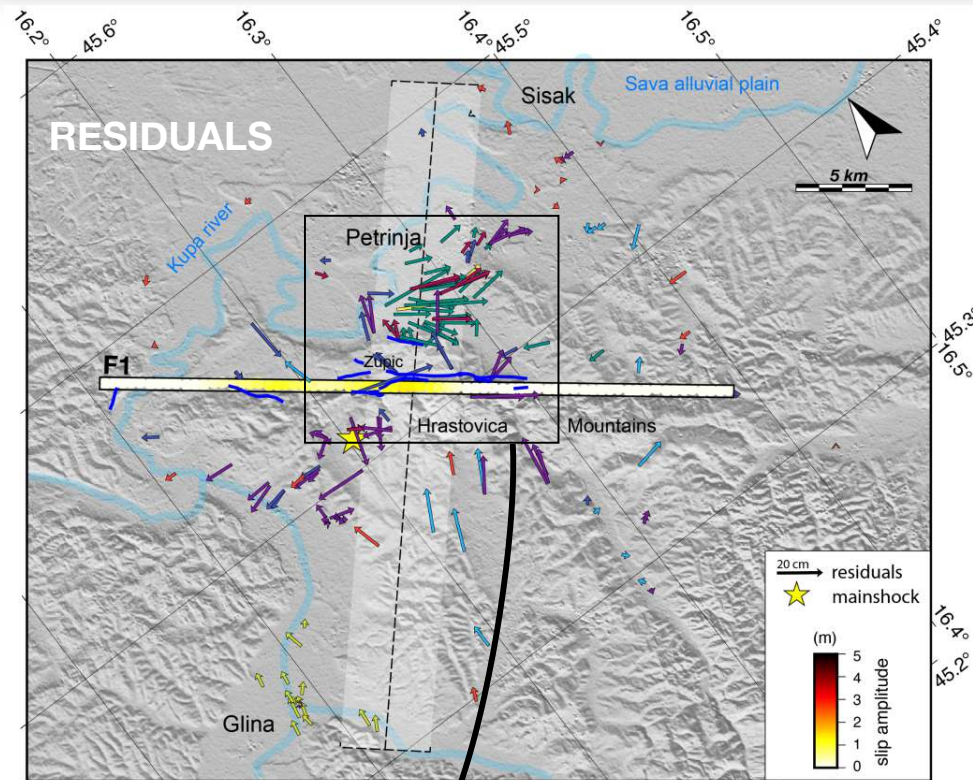


- Fast RTK re-measurements of dense civilian networks
- 169 near-field benchmarks with ~3cm uncertainties on the horizontal components
- 15 far-field continuous GNSS time-series
- Near-field displacements up to 70 cm
- Butterfly pattern as expected for strike-slip EQ
- 5-10 cm of uncorrected postseismic deformation

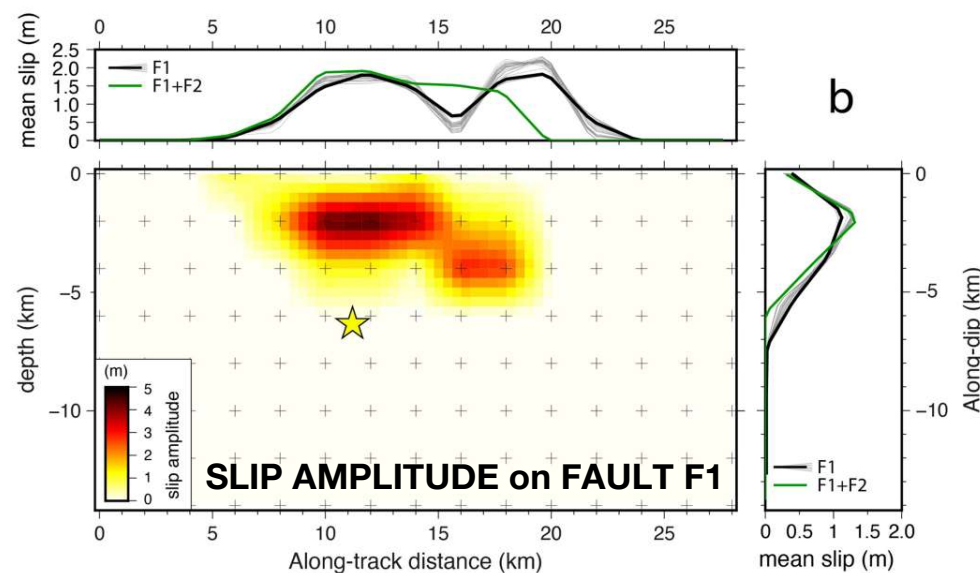
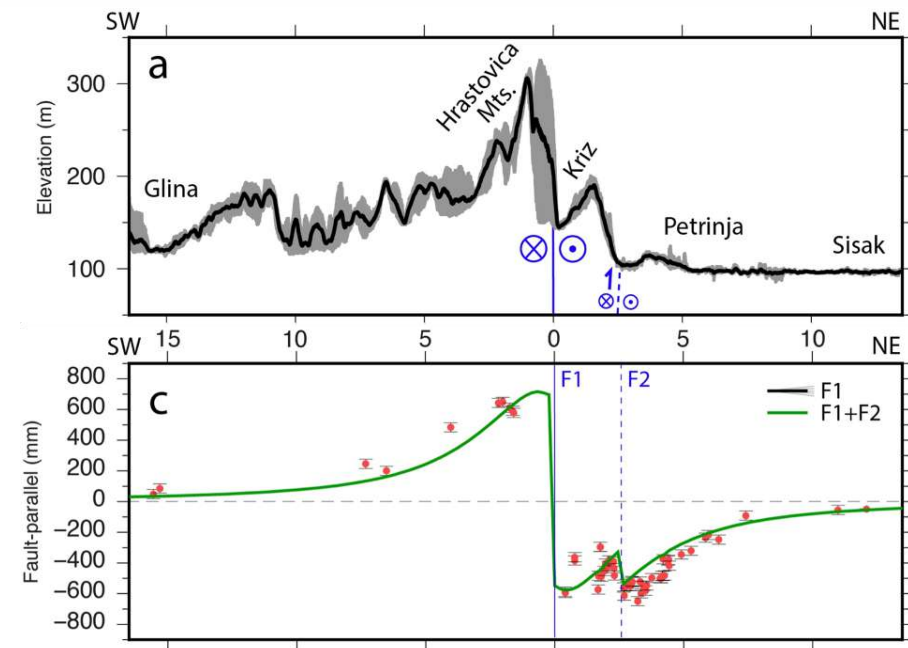
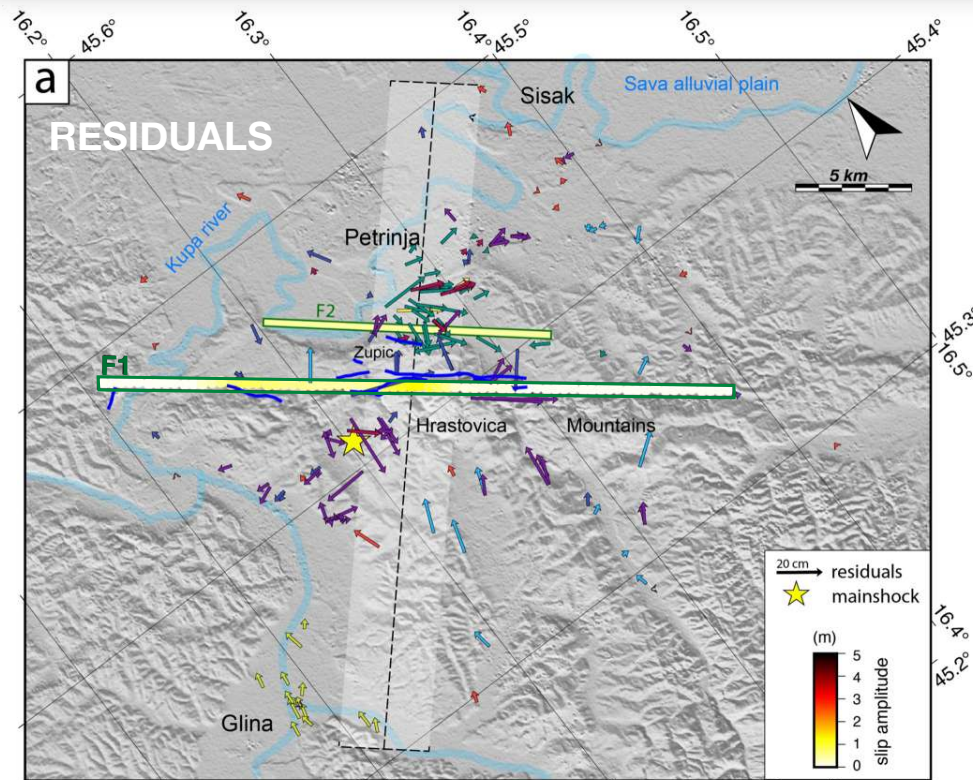




- Right-lateral strike-slip pattern
- 2 shallow slip patches, < 7 km
- Slip amplitude up to 3-4 m at depth
- Slip reaching the surface northward



- Average residual = 6.4 cm
- Spatially coherent residual discrepancies SW of Petrinja
⇒ secondary subparallel fault?



- **F1 solution more compact**
- **Secondary subparallel fault F2**
- **F2 slip amplitude = 37 cm**
- **F2 mostly reverse component**

- ✓ **Dense civilian benchmark** remeasurements can provide very **detailed near-field coseismic** displacement fields in populated areas
 - ✓ Inversion of near-field benchmarks and cGNSS far-field measurements indicates **2 slip patches on the main fault and a significant slip on a parallel secondary fault**
- ⇒ Coseismic displacement data from **optical image correlation** will improve the **near-field coverage** and provide additional constraints on the **slip distribution** of the **2020 Petrinja EQ**

