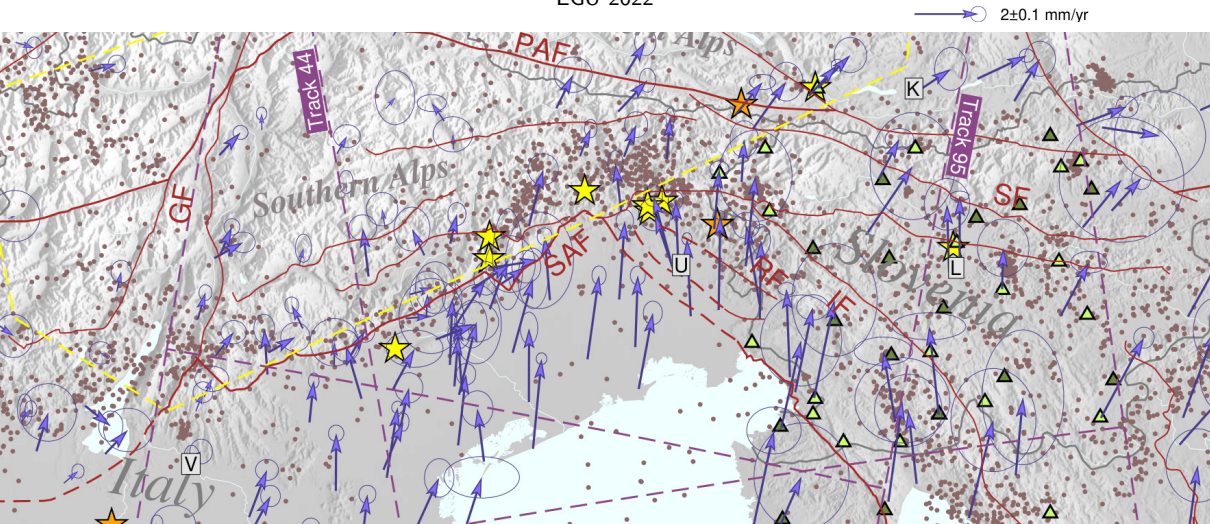
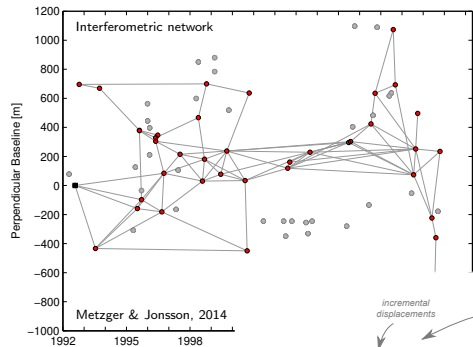


High-resolution rate maps from the Southern-Eastern Alps, compiled from 5-yr-long InSAR time-series

Sabrina Metzger, Milan Lacecký, Najibullah Kakar

EGU 2022



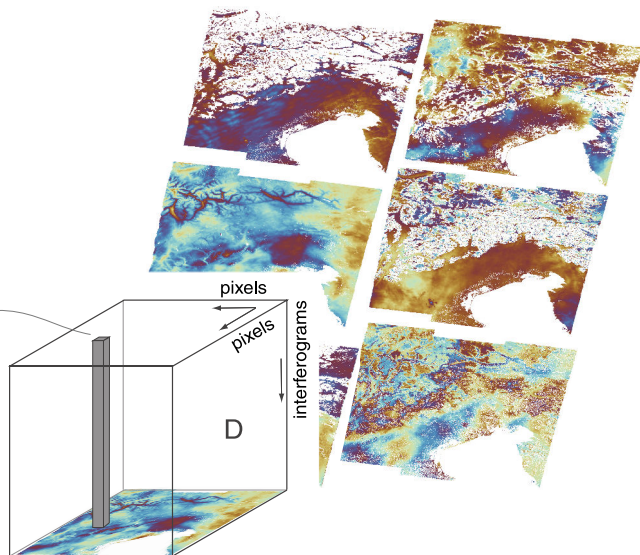


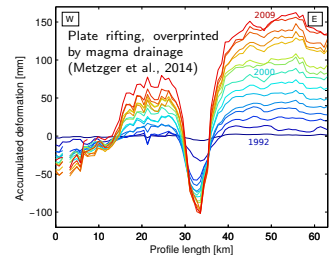
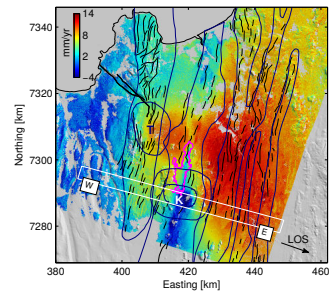
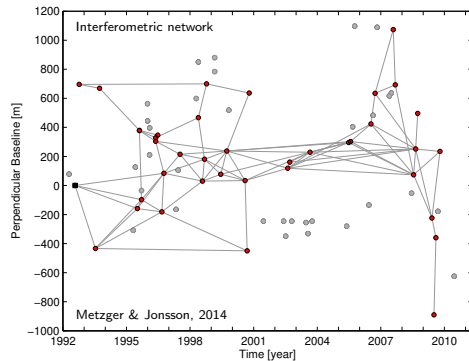
$$\begin{bmatrix} 1 & -1 & 0 & 0 & 0 \\ 1 & 0 & 0 & -1 & 0 \\ 0 & 1 & -1 & 0 & 0 \\ 0 & 0 & 1 & 0 & -1 \\ \vdots & \vdots & \vdots & \vdots & \ddots \end{bmatrix} \begin{bmatrix} m_1 \\ m_2 \\ \vdots \end{bmatrix} = \begin{bmatrix} d_1 \\ d_2 \\ \vdots \end{bmatrix}$$

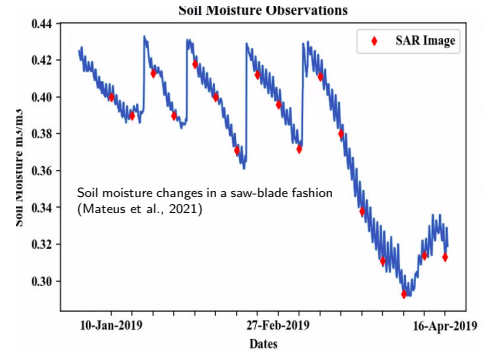
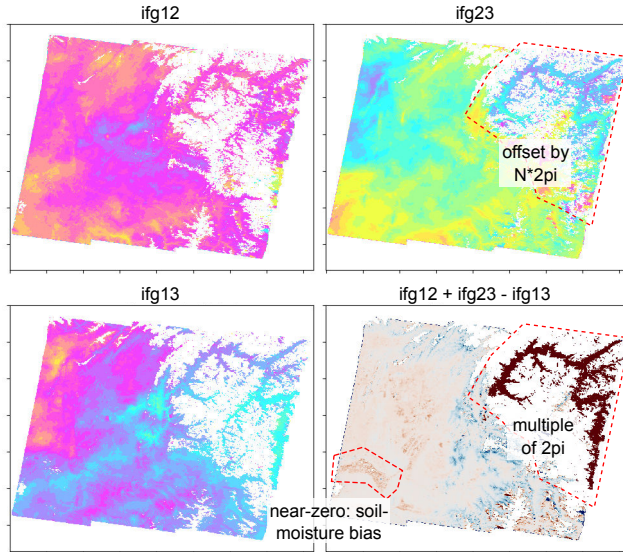
$\begin{matrix} \text{ifg12} \\ \text{ifg14} \\ \text{ifg23} \\ \text{ifg35} \\ \vdots \end{matrix}$

$$Gm = d$$

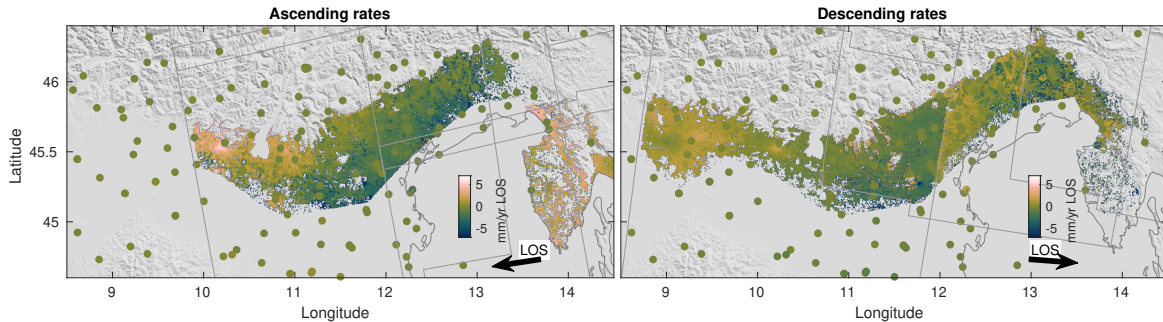
after Schmidt & Bürgmann, 2003







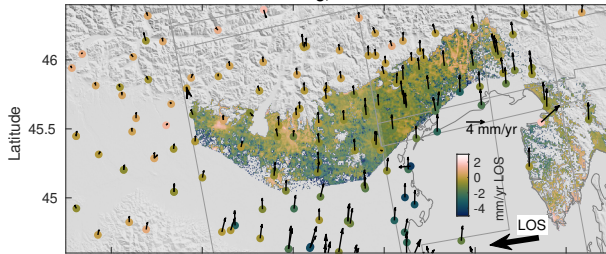
NB: Farm lands apparently subsid-
ing due to soil-moisture bias



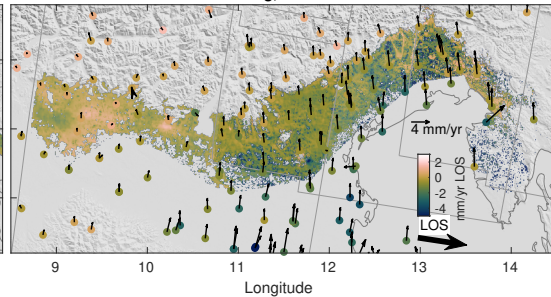
Step 0

Extract average rates for single InSAR tiles in two view angles (above)

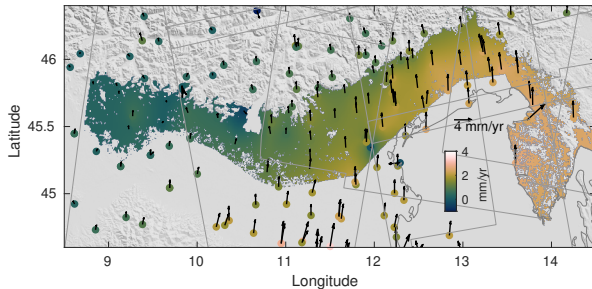
Ascending, stable EU



Descending, stable EU



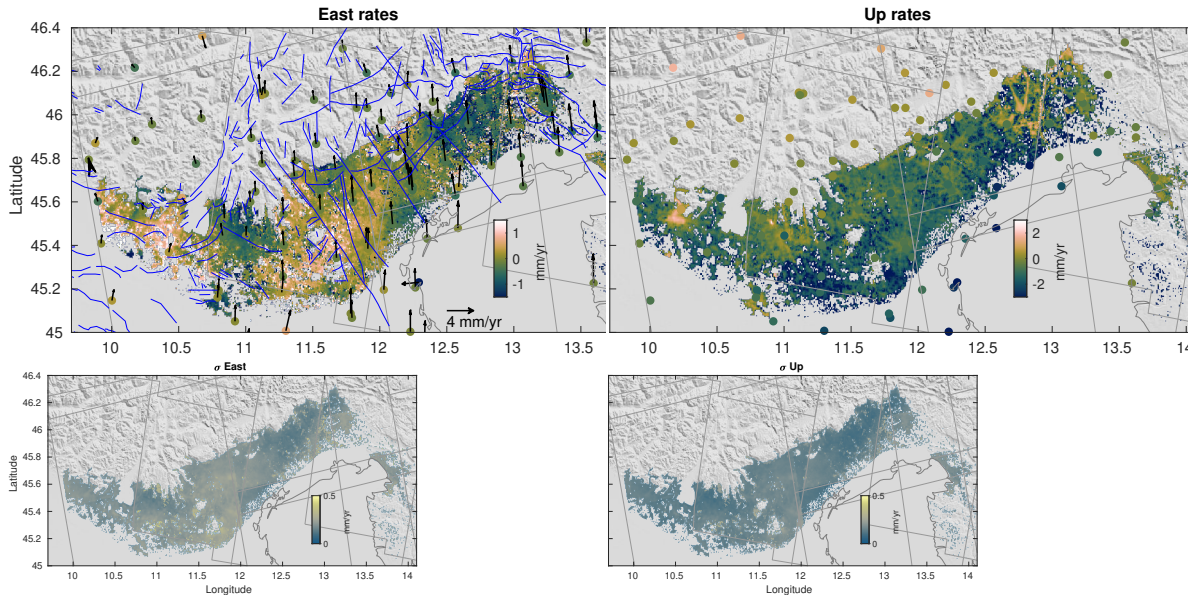
North rates

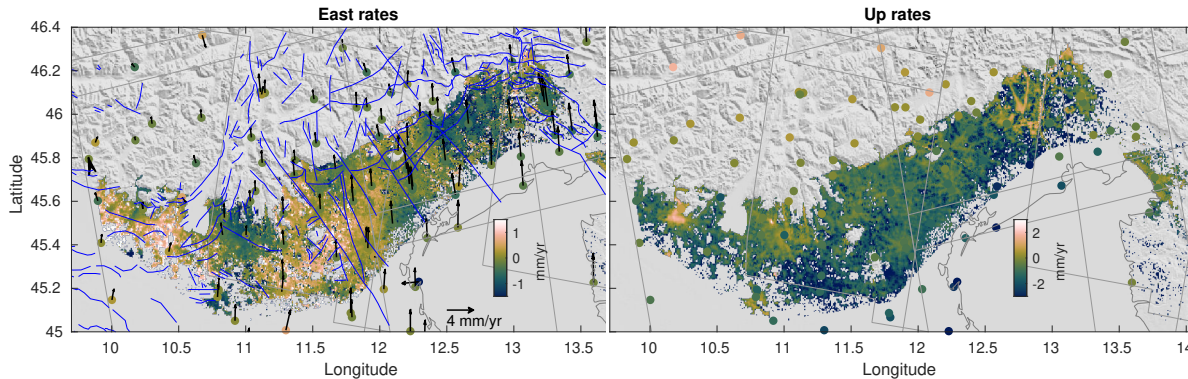
**Step 1**

Tie individual frames to the Eurasian-fixed GNSS reference frame (circles, above)

Step 2

Decompose rates in ascending and descending line-of-sight (LOS) into East and Up by fixing North rates using GNSS data (left)...





Conclusions

- 1 Tectonic signal at detection threshold due to $\sim$ E-W looking radar and vegetation/snow/soil-moisture
- 2 GNSS and InSAR rates reconcile, but the high-resolution deformation pattern is a challenge to interpret

Access InSAR rates from the European Ground Motion Service!

Website: egms.land.copernicus.eu

