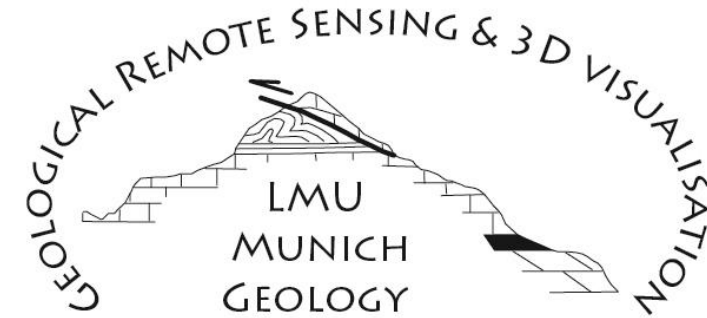


# Surface deformation in emergent salt diapir from PSI data: Finu Diapir in Zagros (Iran)

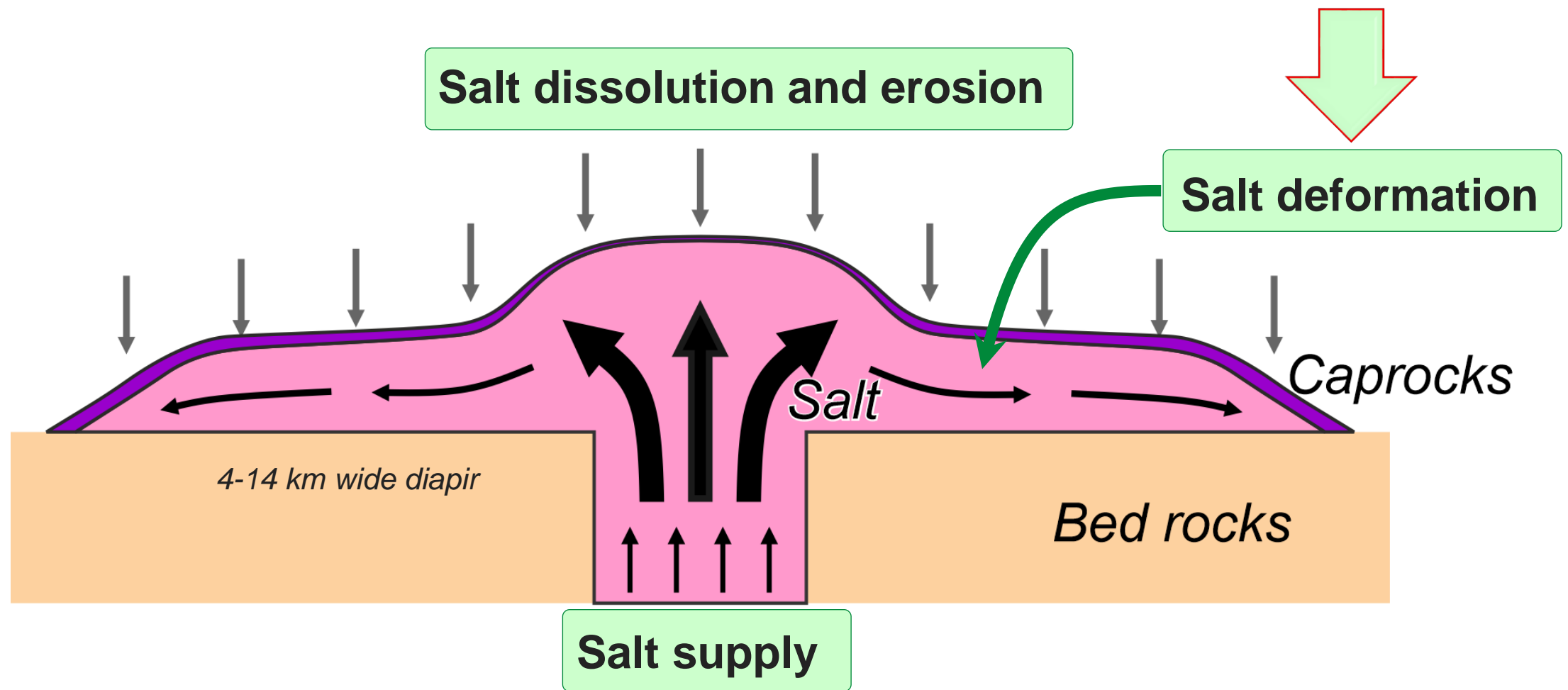


Mjahid Zebari, Anke Friedrich, Christina Plattner, Stefanie Rieger

Department of Earth and Environmental Sciences , Ludwig-Maximilians-University of Munich (LMU), Munich , Germany

Alessandro Parizzi

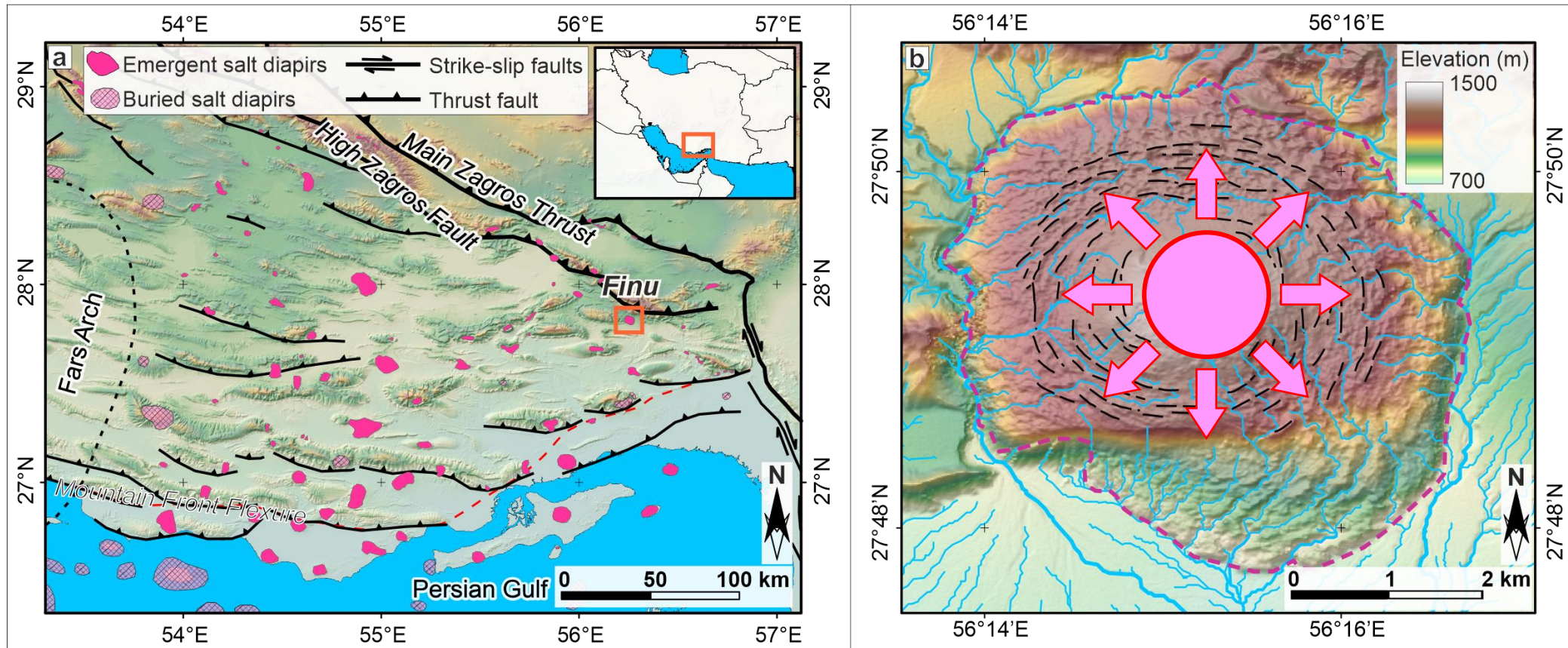
Remote Sensing Technology Institute, German Aerospace Center (DLR), Weßling, Germany



- Ground surface deformation **Geodetic techniques (InSAR)**
- **Persistent Scatterer Interferometry (PSI)**
- Extracted from **Sentinel-1** Synthetic Aperture Radar (**SAR**) data
- Data by the German Aerospace Agency (**DLR**)
- Cover 4 years (2014 - 2018)

# Salt diapirs in Zagros , Finu Diapir as an example

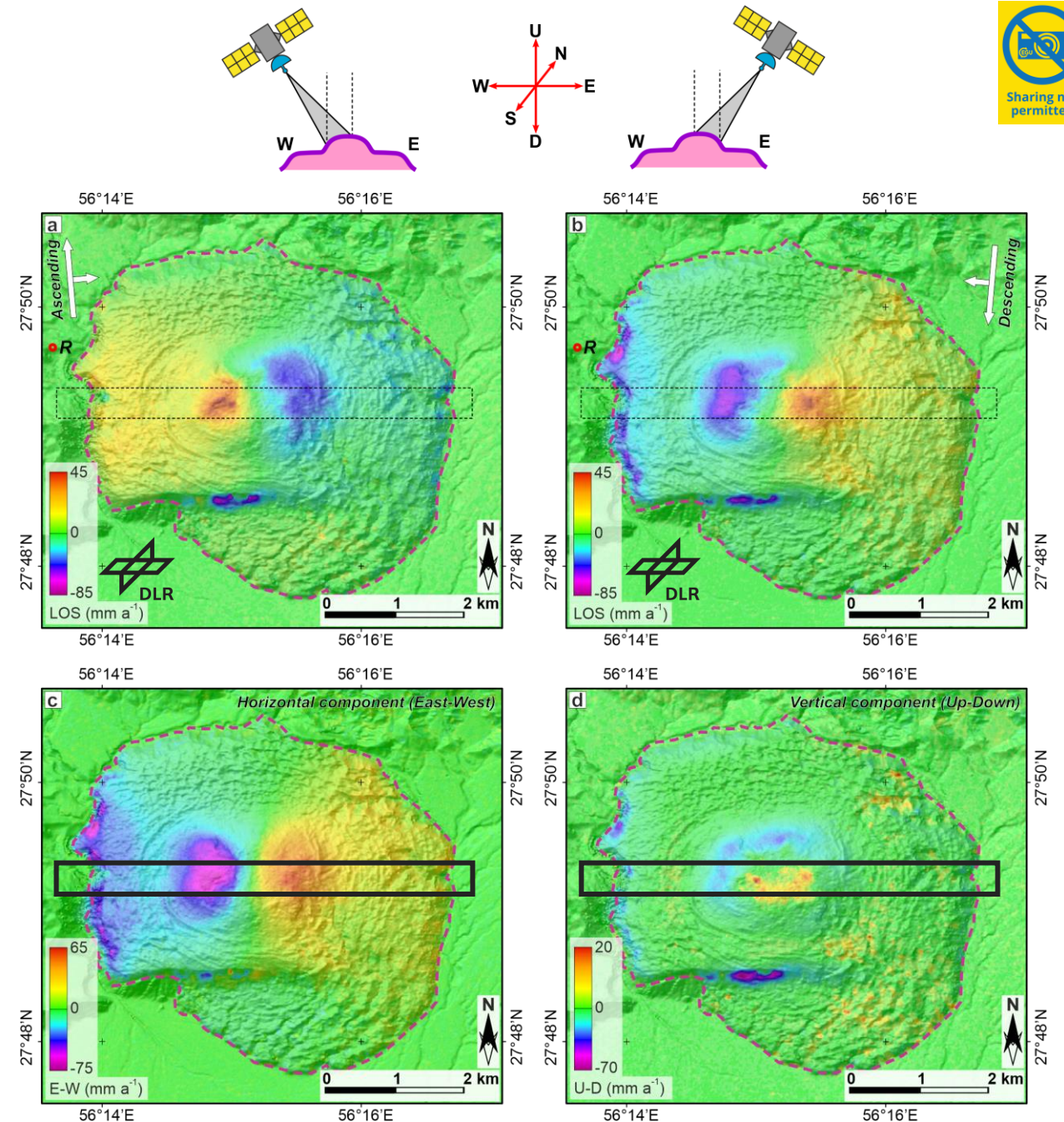
- Radial movement of the salt away from the center in all direction.
- Gravity spreading of salt on slopes.





# Deformation from PSI data

- Deformation is in the Line-of-sight (LOS) for both ascending (eastward looking) and descending (westward looking) tracks.
- Detect maximum deformation on Eastward- and Westward-facing slopes.
- East-West and Up-Down components of deformation.
- E-W trending swath profile across the diapir.

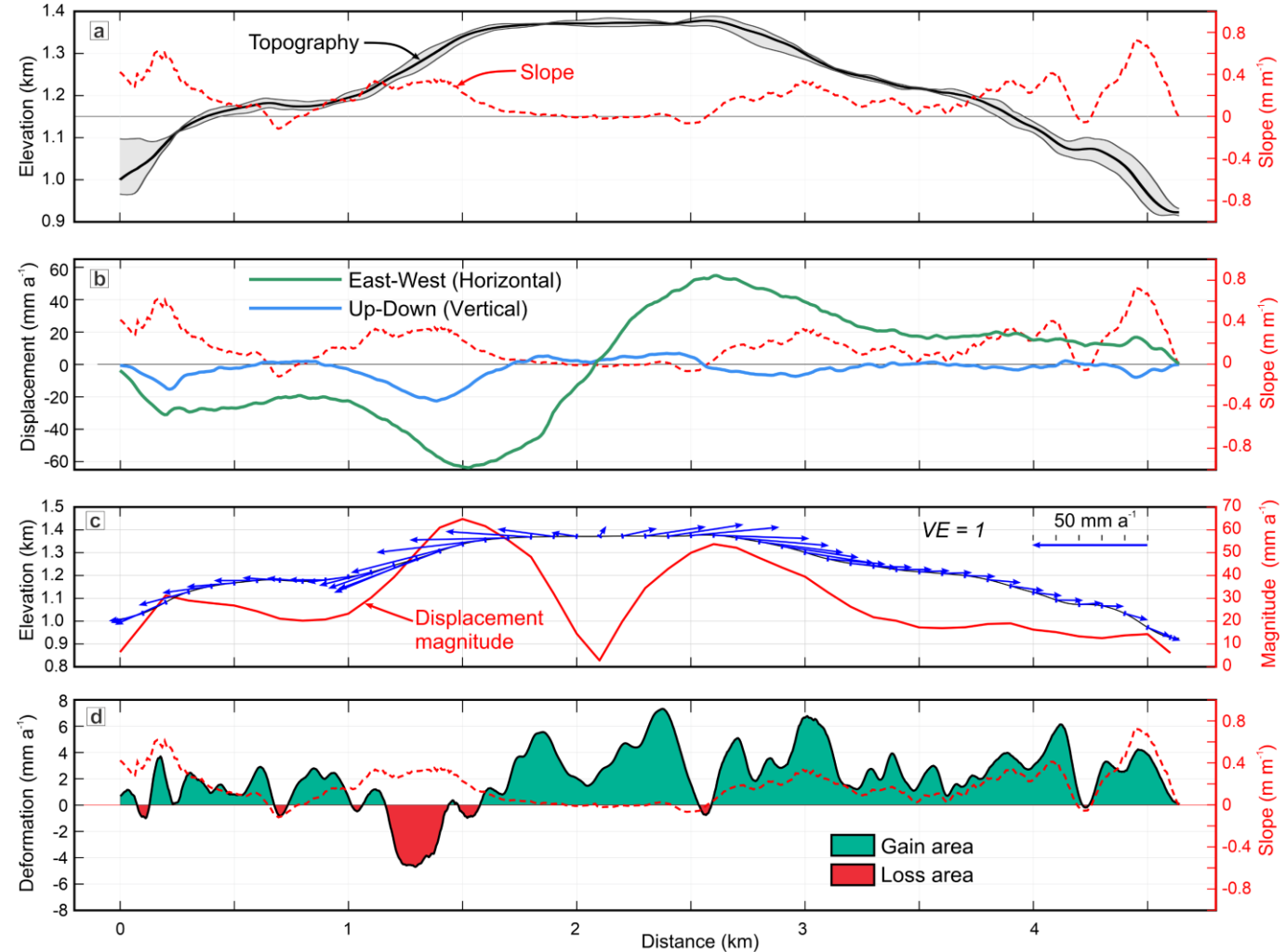


# Deformation across the diapir (swath profile)

- Topography and slope.
- Horizontal (East-West) and Vertical (Up-Down) components of displacement.
- Overall displacement vectors.
- The difference between the original (reference) and deformed profiles.
- Gain area:  $9.8 \pm 0.97 \text{ m}^2 \text{ a}^{-1}$ .
- Salt supply > Dissolution and erosion

Original profile

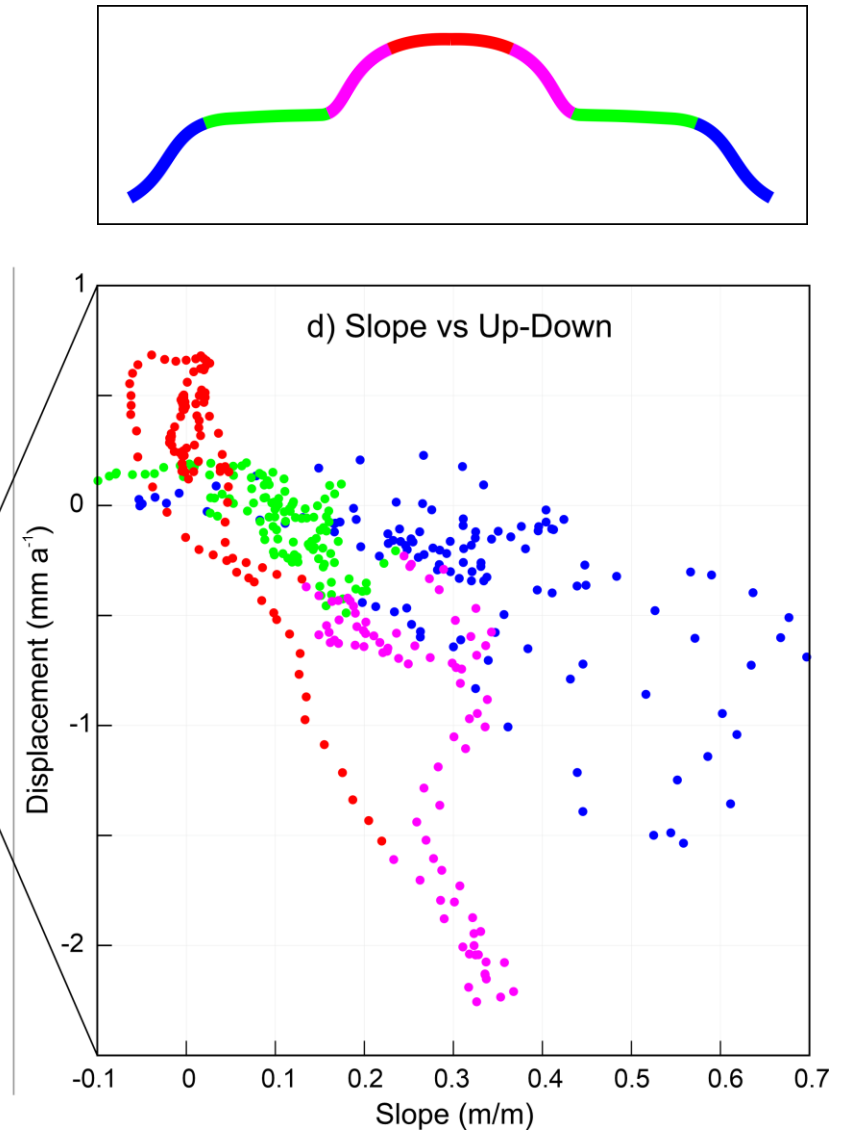
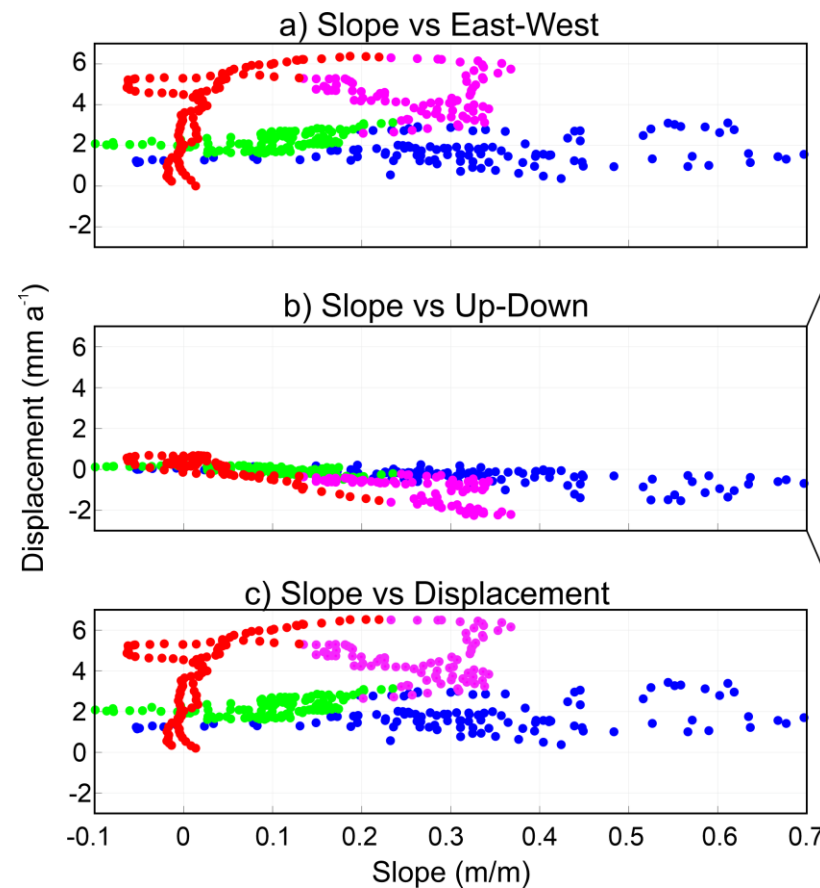
Deformed profile



# Deformation vs Slope and Location



- Horizontal (East-West) displacement reflects location.
- Vertical (Up-Down) displacement reflects slope and location.
- Horizontal  $\gg$  Vertical.
- Overall deformation magnitude reflects the horizontal displacement.



## Closing Remarks:

- Both local slope and locality within the diapir are reflected in magnitude and direction of the salt displacement.
- In Finu diapir, salt supply is exceeding salt dissolution and erosion.
- This approach can be applied to other symmetrical diapirs.

# ***Thank You***

- Please contact ***Mjahid Zebari*** ([\*m.zebari@lmu.de\*](mailto:m.zebari@lmu.de)) for further questions, discussion, and information.
- This work is part of a joint project between the *University of Munich (LMU)*, the *Czech Academy of Sciences*, and *Charles University*.
- A collaborative publication is under preparation.
- The data have been prepared by *DLR* and analyzed by *LMU Geology* and may not be released to third parties without permission.
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