

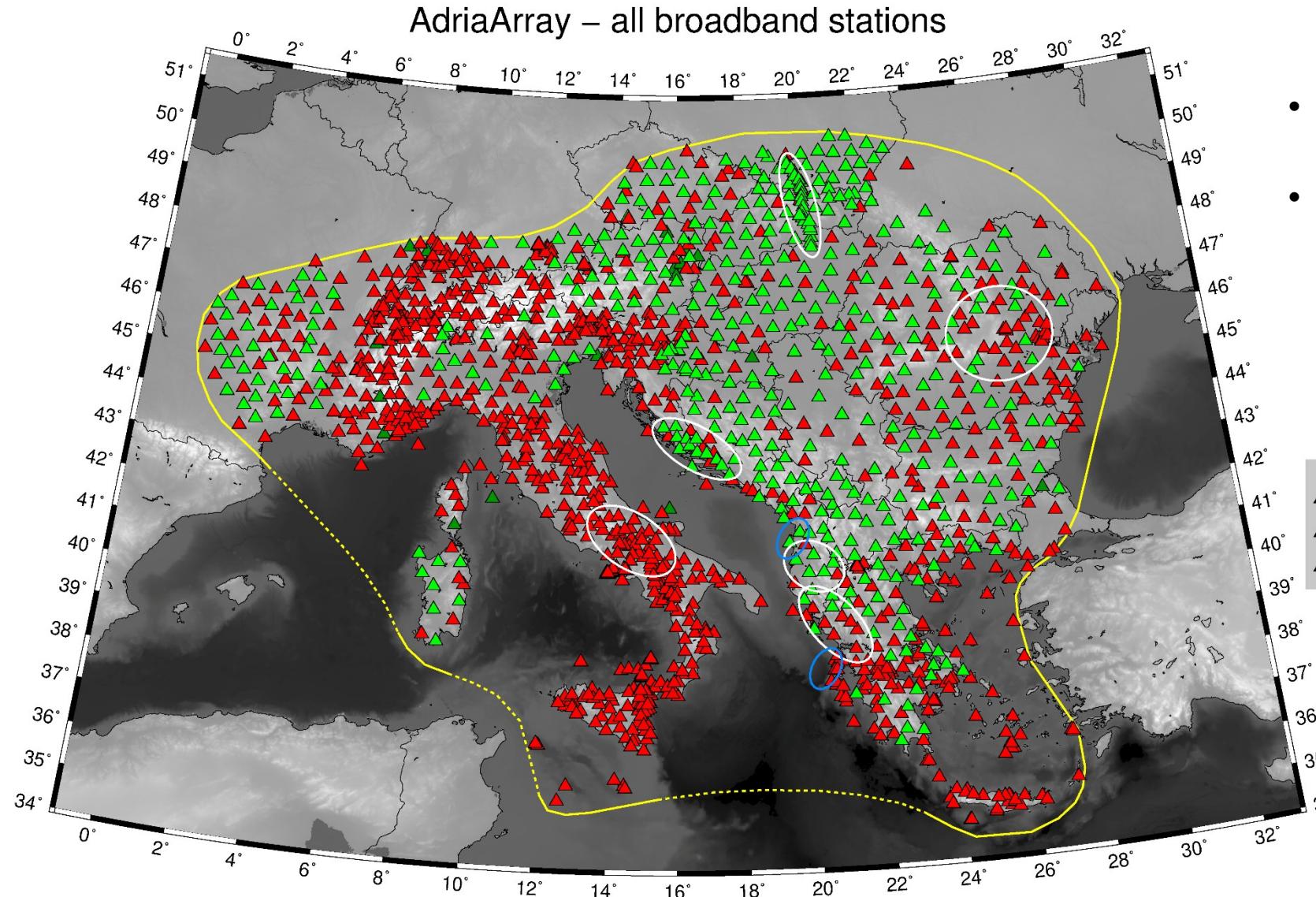
AdriaArray EGU Splinter Meeting

Vienna, May 1, 2025

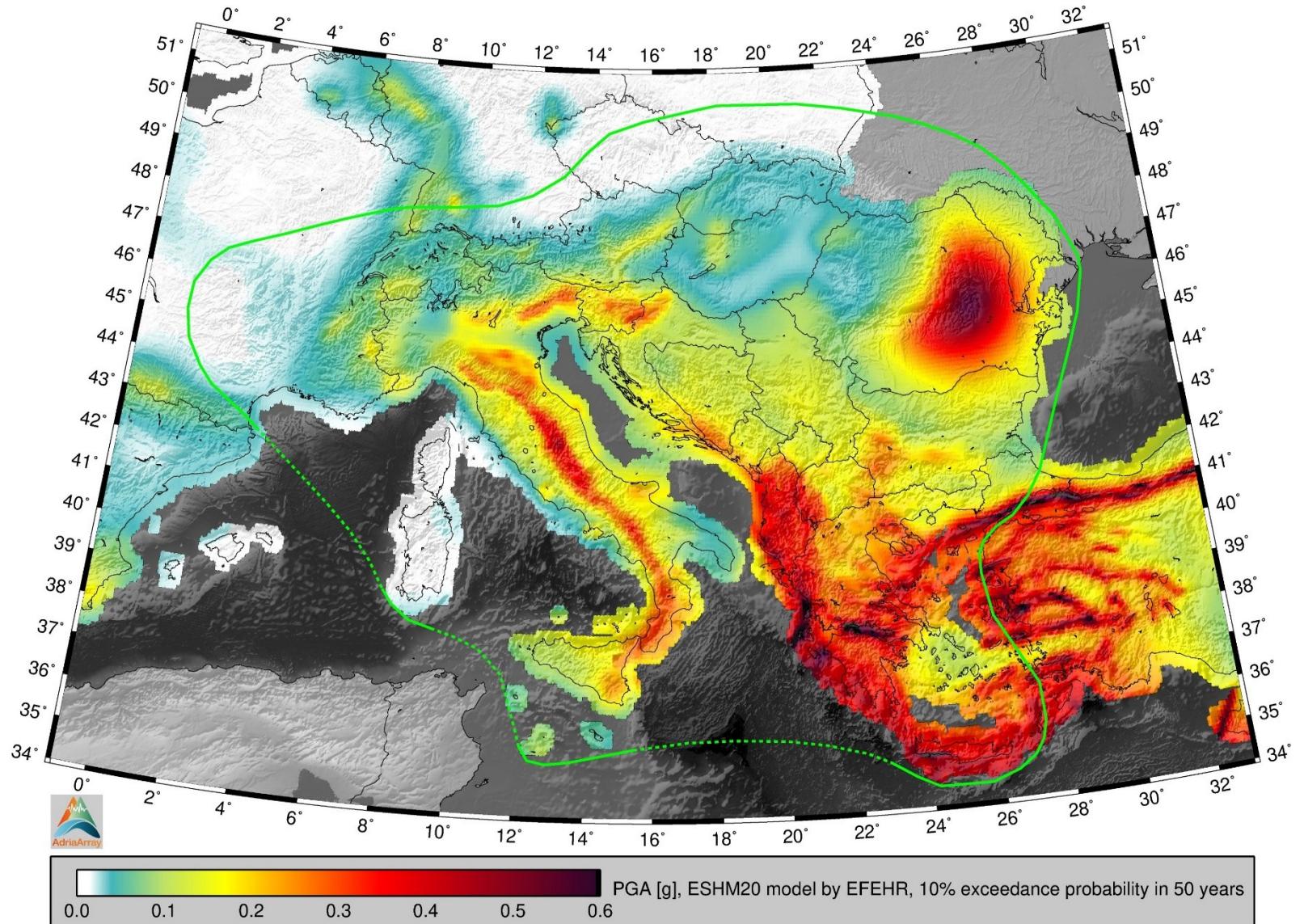
P. Kolínský (CAS, Prague), T. Meier (CAU Kiel)

1. Status of AdriaArray (operation, data availability, data quality)
2. 6th AdriaArray Workshop in Venice
3. Publications
4. Future activities

AdriaArray

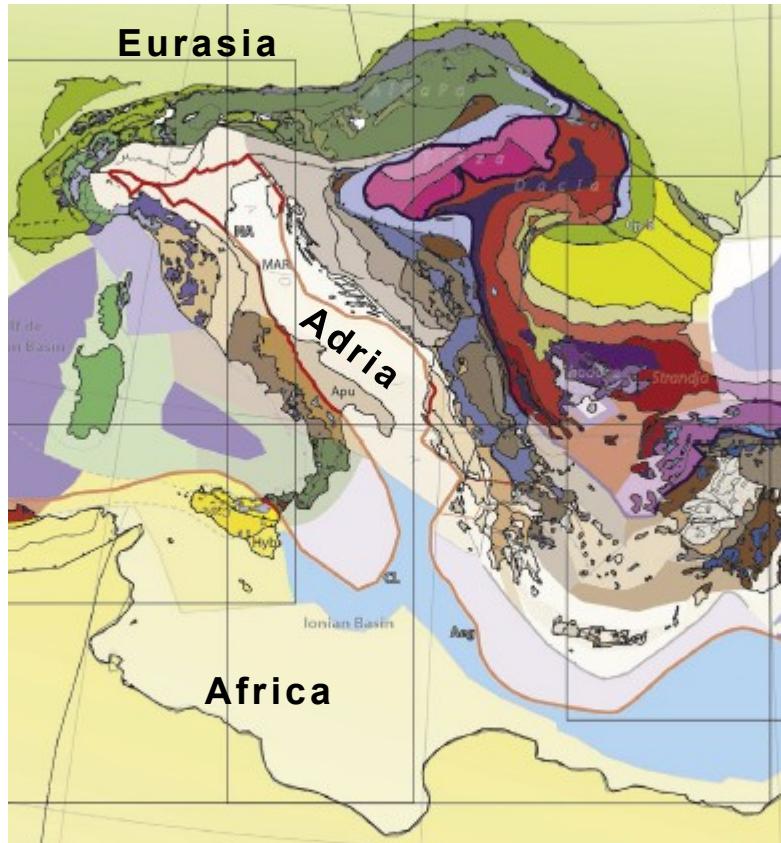


Geohazards

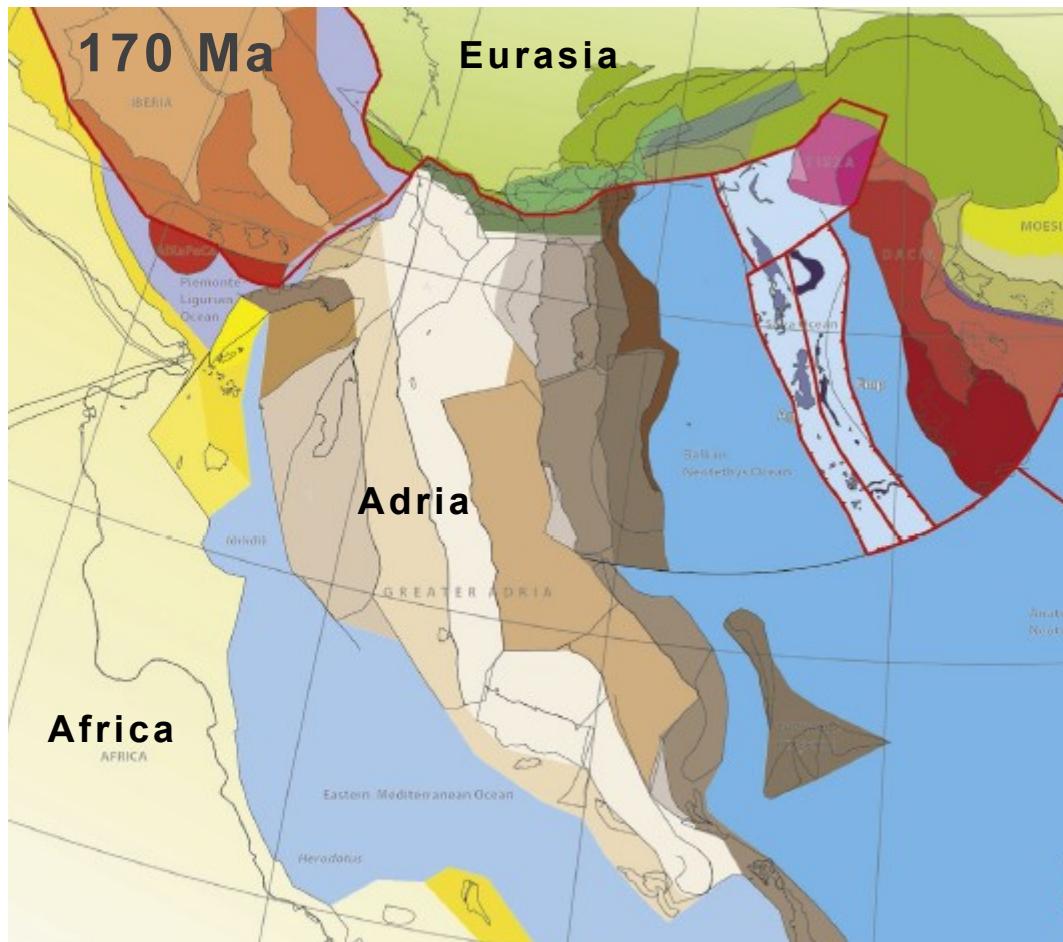


Adria: tectonic reconstruction

0 Ma

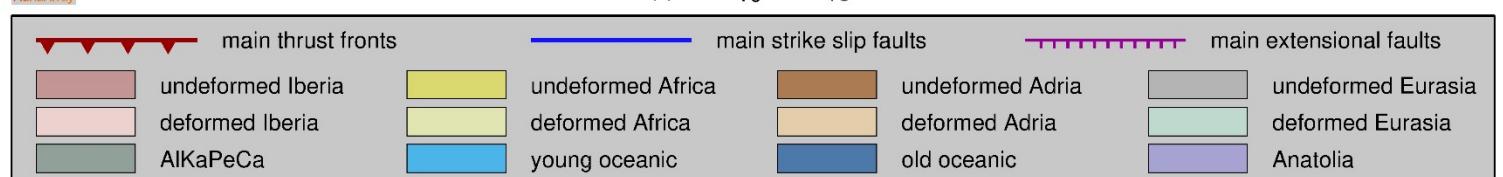
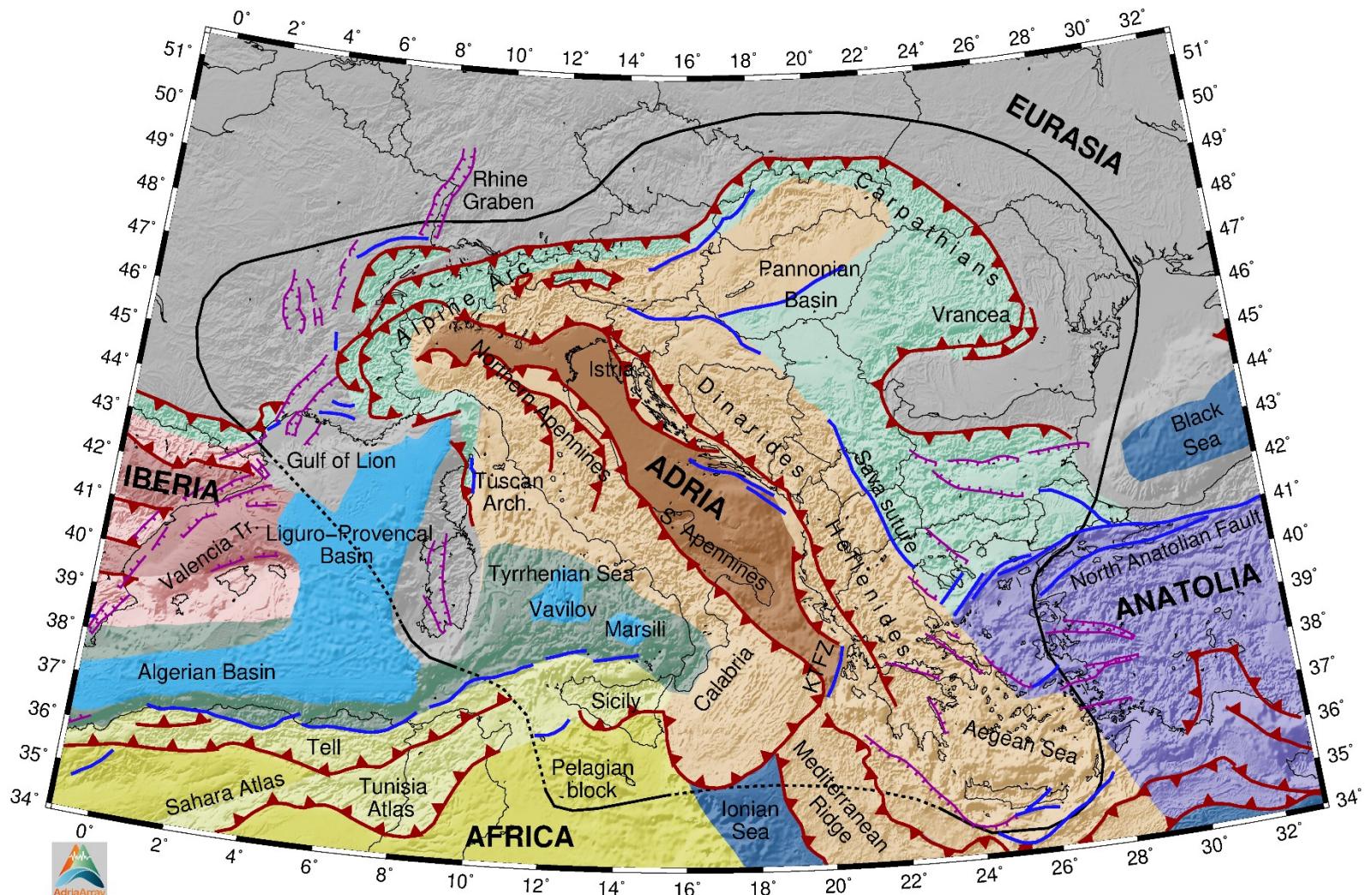


size of Adria reduced by ca. 70 %



van Hinsbergen et al. (2020)

Tectonics

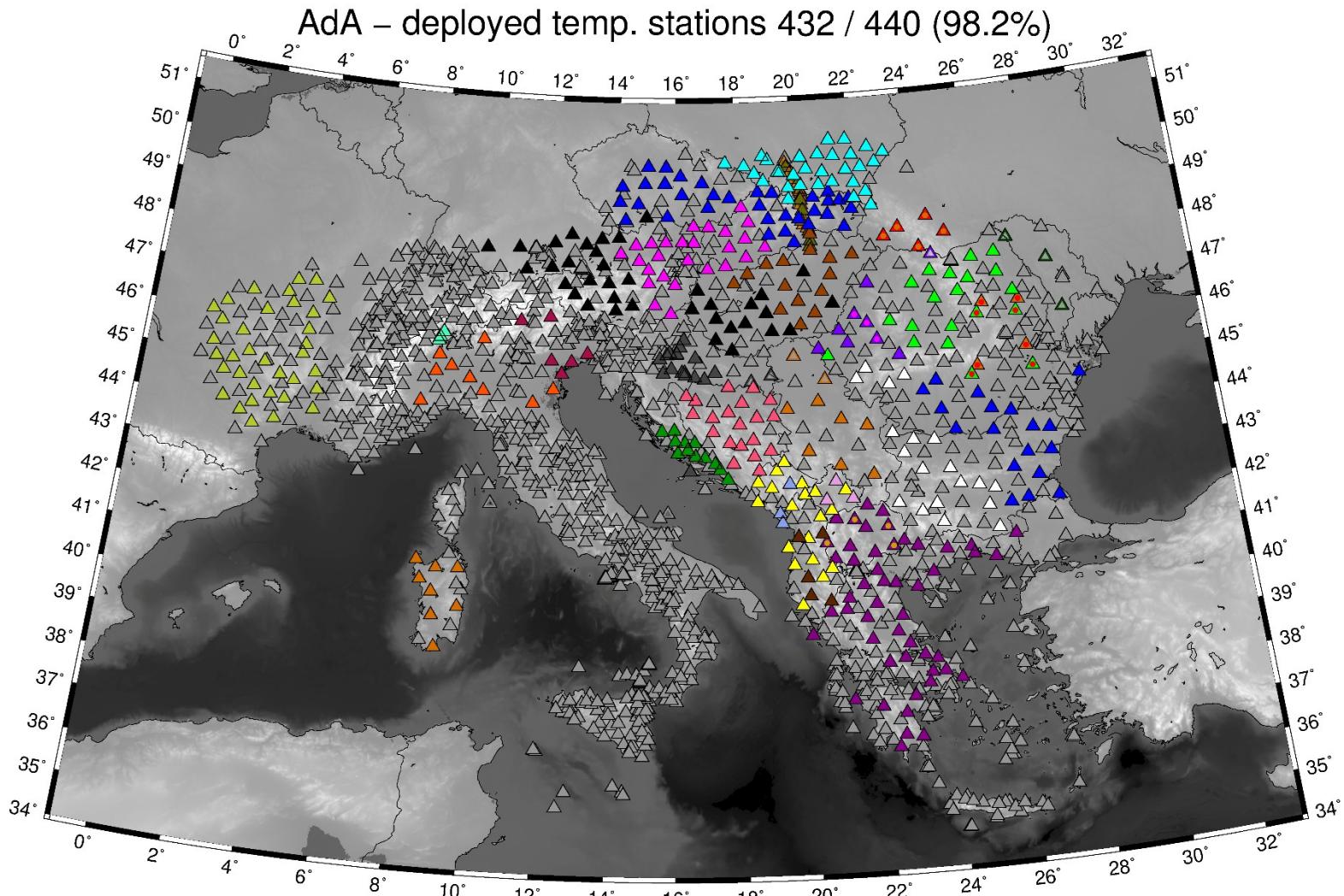


AdriaArray - status



- proposed 2018: AlpArray Science Meeting Zürich
- Preparation from 2019 – 2022
- AdriaArray Seismology Group founded in 2022
- Deployment of stations 2022 – 2026
- AdriaArray Workshops:
 - Thessaloniki 2019
 - Online Workshops (EPOS/ORFEUS): 2020, 2021
 - AdriaArray/EPOS/ORFEUS Workshop Potsdam 2022
 - Dubrovnik 2023
 - Sofia 2024
 - Venice 2025
- Resubmission COST proposal: October 2024

AdriaArray - status



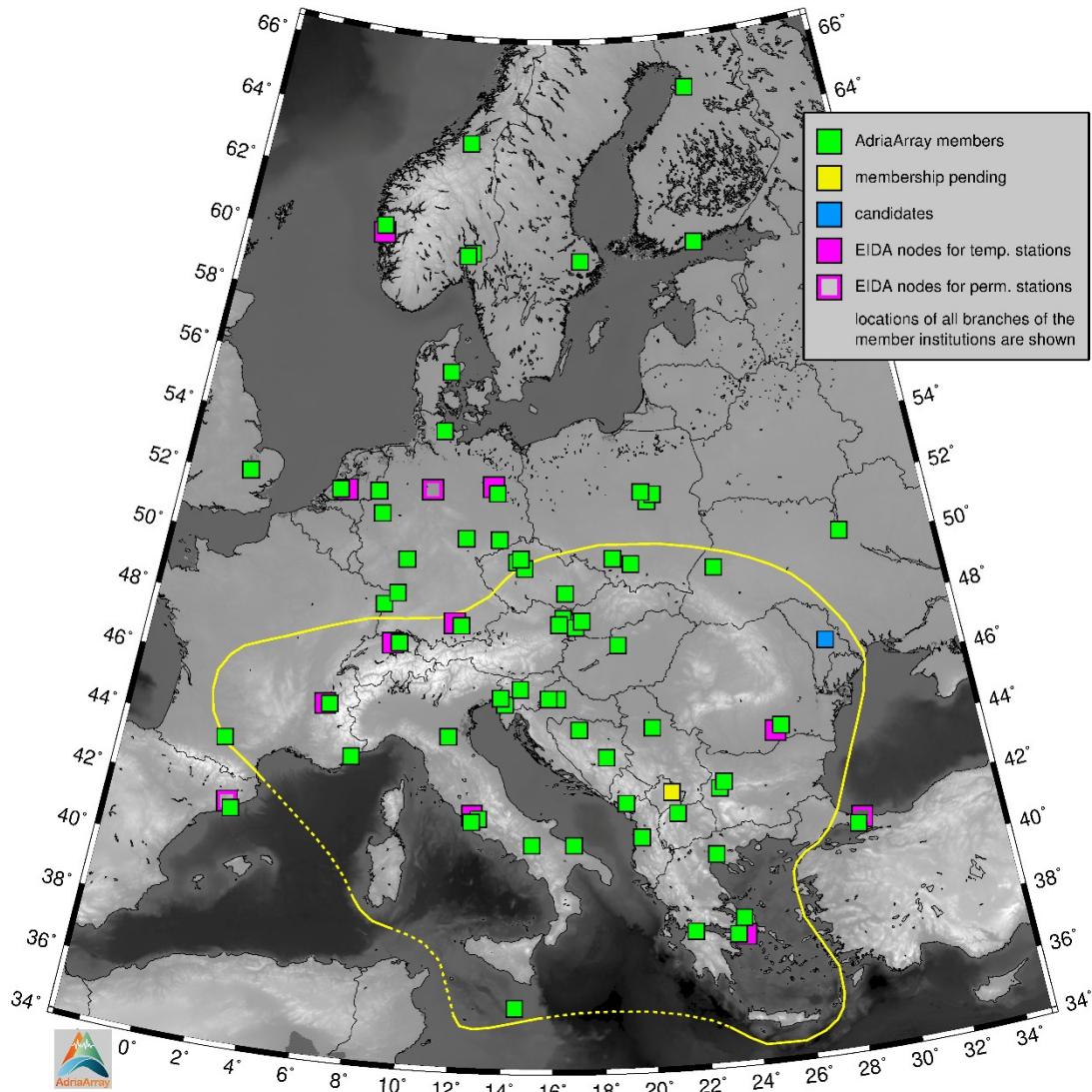
| |
|-----------------------------|
| Geoazur + GIPP |
| Uni Jena, Germany |
| GIPP, GFZ, Germany |
| GIPP + IRSM |
| GIPP + Carpathian Project |
| Karlsruhe IT, Germany |
| NIEP Pool, Romania |
| Kosovo Pool |
| Montenegro Pool |
| Croatia Seism. Survey |
| INGV Bologna, Italy |
| ETH Zurich, Switzerland |
| OQS, Italy |
| Resif-Sismob, France |
| Uni Wien, Austria |
| Uni Munich, Germany |
| Uni Bochum, Germany |
| Uni Bochum + Uni Frankfurt |
| Uni Twente, the Netherlands |
| EPSS, Hungary |
| Uni Kiel, Germany |
| Norwegian Pool + Uni Zagreb |
| Uni Oulu, Finland |
| Uni Oulu + Uni Wien |
| Unis + PAS, Poland |
| Uni Aarhus, Denmark |
| Uni Helsinki, Finland |
| Uni Helsinki + IRSM Prague |
| IG CAS Prague, CZ |
| permanent BB stations |
| operating |
| planned |

AdriaArray - status



L. Vecsey

AdriaArray - status



**AdriaArray Seismology Group
(founded in 2022)**

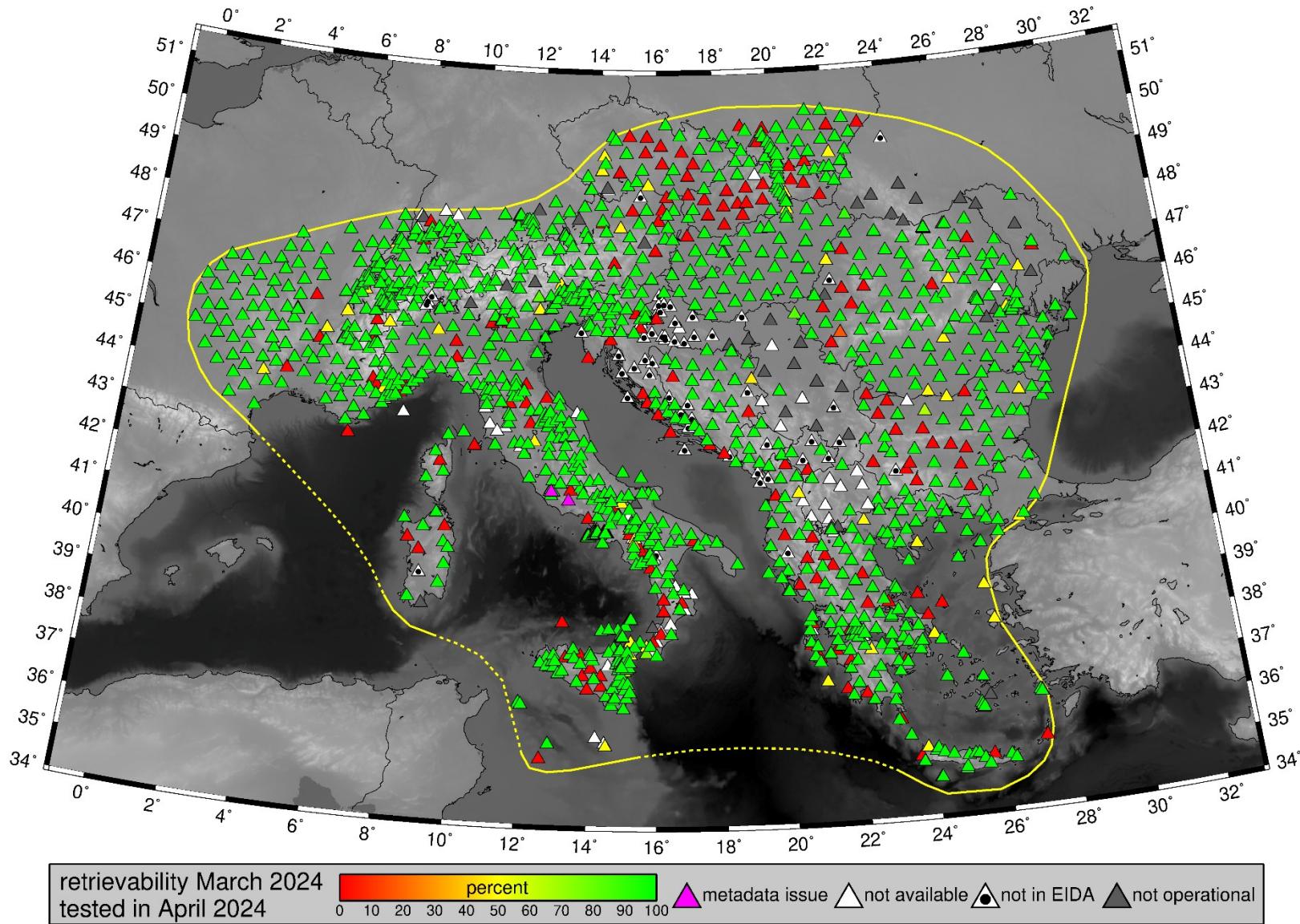
64 member institutions

442 participants

30 countries

12 EIDA nodes (Athens, Barcelona, Bergen, BGR, ETH Zurich, GFZ, INGV, Kandili, Munich, NIEP, ODC, RESIF)

AdriaArray - status

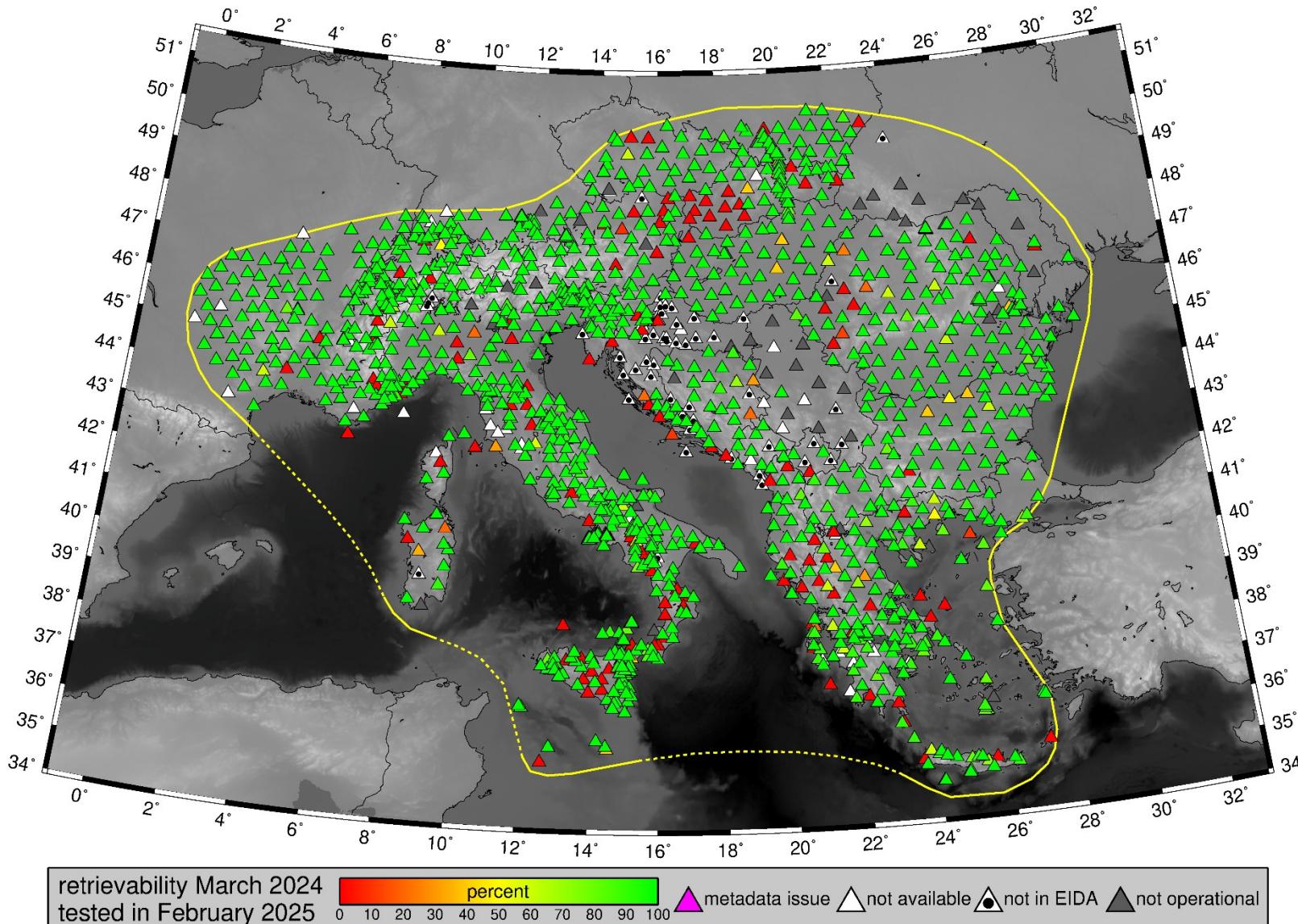


Data quality control:

- Availability
- Signal-to-noise ratio
- Metadata?

Together with ORFEUS (UAG, MB, TC)

AdriaArray - status



Data quality control:

- Availability
- Signal-to-noise ratio
- Metadata?

Together with ORFEUS (UAG, MB, TC)

Backfilling of data

Albania, Austria, Croatian Seismological Service, Kosovo, Montenegro, Moldova



Working Groups

Data QC

(QCing, data availability, noise conditions, metadata)

- contacts: Petr Kolínský (petr.kolinsky@ig.cas.cz), Thomas Meier (thomas.meier@ifg.uni-kiel.de)

Communication and outreach

(Maintaining list participants, managing tokens, developing and updating web page, communication with participants and the public)

- contacts: Gregor Rajh (gregor.rajh@gov.si), Gergana Georgieva (ggeorgieva@phys.uni-sofia.bg)

Early Career Scientists

(networking among ECS, participation in and suggestions of AdriaArray activities, organization of webinars)

- contacts: Felix Eckel (felix.eckel@ifg.uni-kiel.de), Henrique Roisenberg (henrique.bergerroisenberg@uniroma3.it), Tanishka Soni (ndsoni@cyf-kr.edu.pl)

Structure of AdriaArray Seismology Group

- **Members:** participating groups or institutions
 - Permanent or temporary stations
 - Providing data, QC, methods, software, outreach, organization
- **Steering Committee:**
 - one representative per member
- **Participants:** persons affiliated with member institutions or groups
- **Data access via EIDA:**
 - permanent stations: available immediately
 - temporary stations: available immediately for AdriaArray participants, in general a rolling embargo of two years is applied to public access (depending on the decision by the deploying and hosting institutions also immediate access to the public is possible)
- **real-time data exchange of AdA data:** according to existing institutional agreements

Collaborative Research Group ,Seismicity and seismic sources'



Chairs:

Edmond Dushi (edmonddushi@yahoo.com), *Felix Borleanu* (felix@infp.ro)

email list: adriaarray-seismicity@gfz-potsdam.de

Activities:

- **Homogeneous Seismic Catalogs:** Harmonization of earthquake catalogs and integration of national datasets into a regional framework.
- **Best Practices:** Standardization of earthquake locations, source parameters, and moment tensor solutions.
- **Efficient Data Processing:** Collaborative methods for handling large datasets within the AdriaArray initiative.

Collaborative Research Group ,Receiver functions'



Chairs:

Gergana Georgieva (ggeorgieva@phys.uni-sofia.bg),

Stéphane Rondenay (rondenay@uib.no),

Josip Stipčević (jstipcevic.geof@pmf.hr)

Activities:

- Planning joint activities
- training & benchmarking of tools
- coherent set of receiver function products

Collaborative Research Group ,Surface wave and ambient noise tomography'



Chairs:

Irene Molinari (irene.molinari@ingv.it),

Anne Obermann (anne.obermann@sed.ethz.ch),

Laura Petrescu (laura.petrescu90@gmail.com)

Activities:

- Database of continuous data
- Repository of phase and group velocity maps
- Benchmarking of imaging tools

Initial contacts:

Anila Xhahysa (anila.xhahysa@yahoo.com)

Olga Ktenidou (olga.ktenidou@gmail.com),

Iva Dasović (iva.dasovic@gfz.hr),

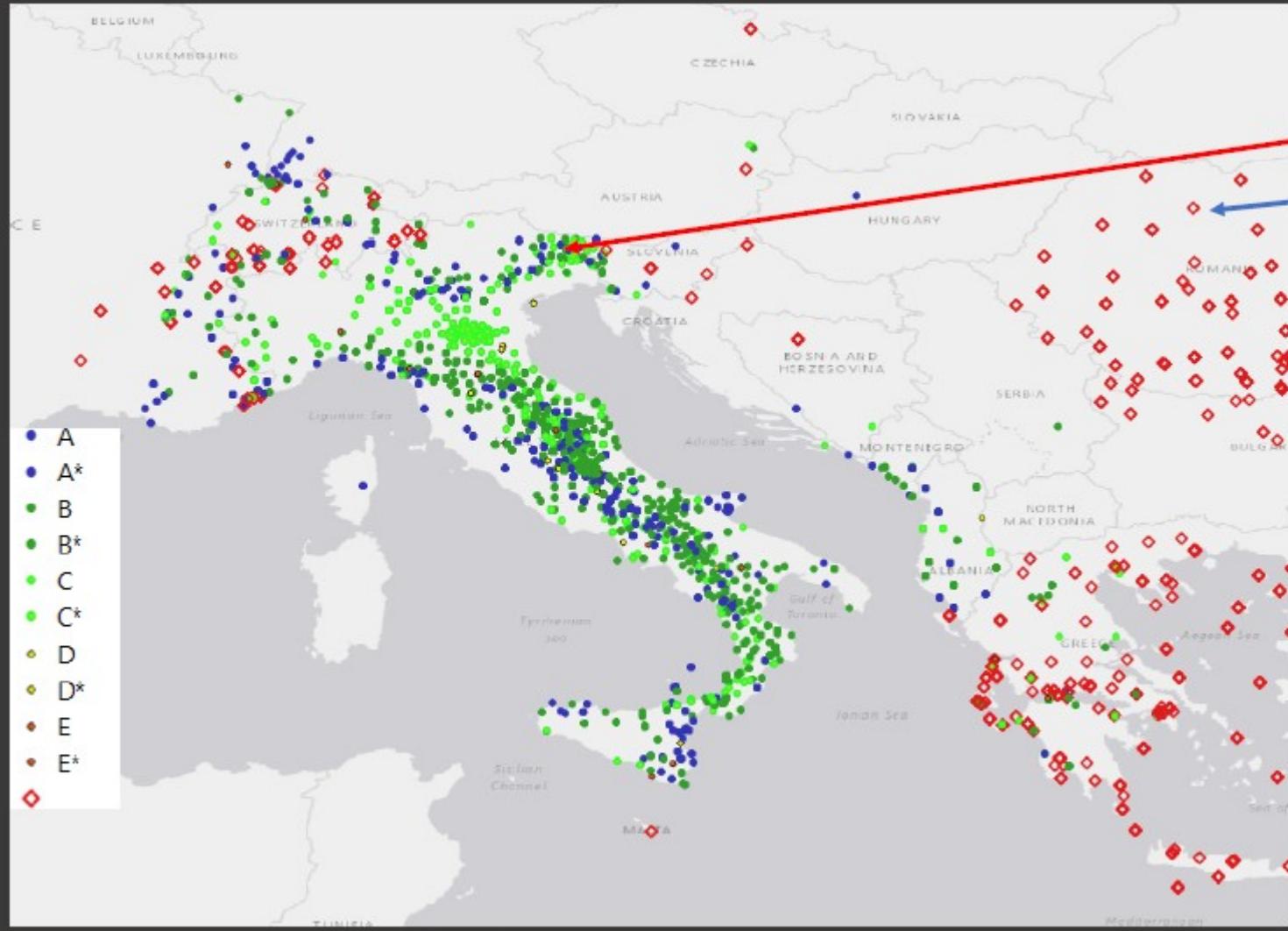
Costas Papazachos (kpapaza@geo.auth.gr)

Discussed activities:

- Collection of information on site characteristics
- Benchmarking of tools constraining the near-surface structure & training
- H/V, GMPEs, attenuation/kappa, Vs(30)

CRG ,Engineering Seismology'?

<https://esm-db.eu/#/station/search>



Site-characterization of seismic stations in ESM:

defined
undefined

Anila Xhahysa

Chair:

Thomas Meier (thomas.meier@ifg.uni-kiel.de)

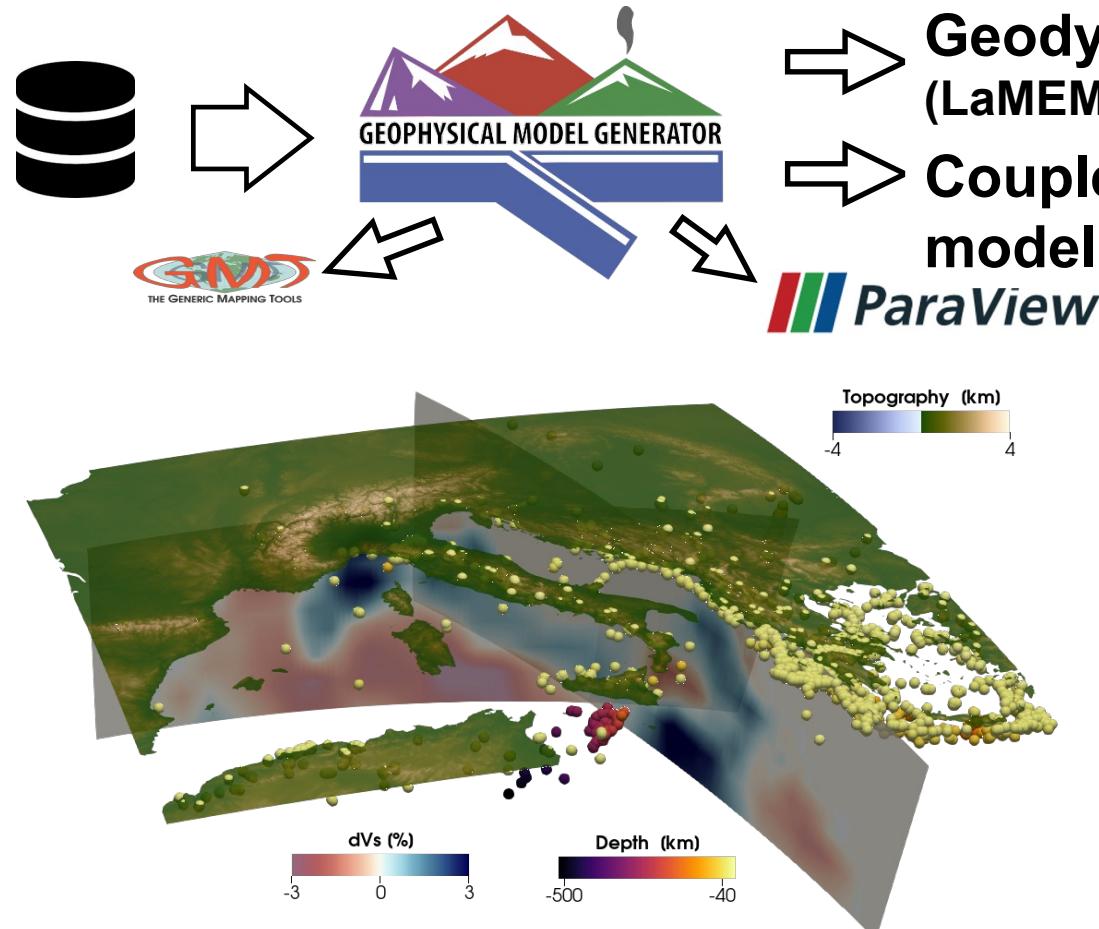
Activities:

- Collecting geophysical observables for the AdriaArray region constraining crustal and upper mantle structure & import in the Geophysical Model Generator (GMG)
- Development of slab hypotheses using the GMG
- Setting up 3D models of seismic velocities, densities, temperatures, viscosities for synthetic resolution tests and geodynamic modelling

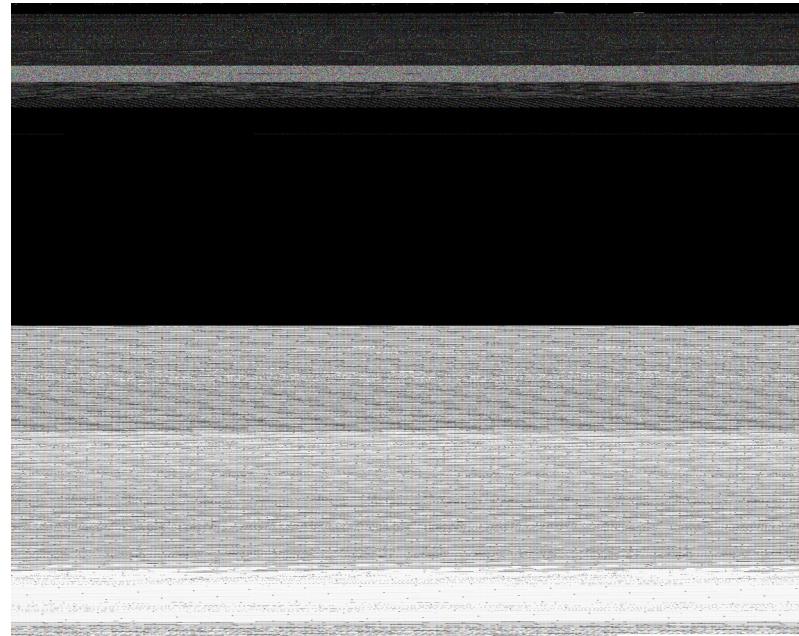
CRG ,Linking geophysical observables and geodynamics'



1. Repository of observations (passive seismic imaging, seismicity, ...)
2. Interpretation -> creation of input models (hypotheses) for geodynamic modelling (crust & mantle)
3. Comparison of different geodynamic and geohazard scenarios with observed topography, kinematics, uplift, anisotropy, stress field

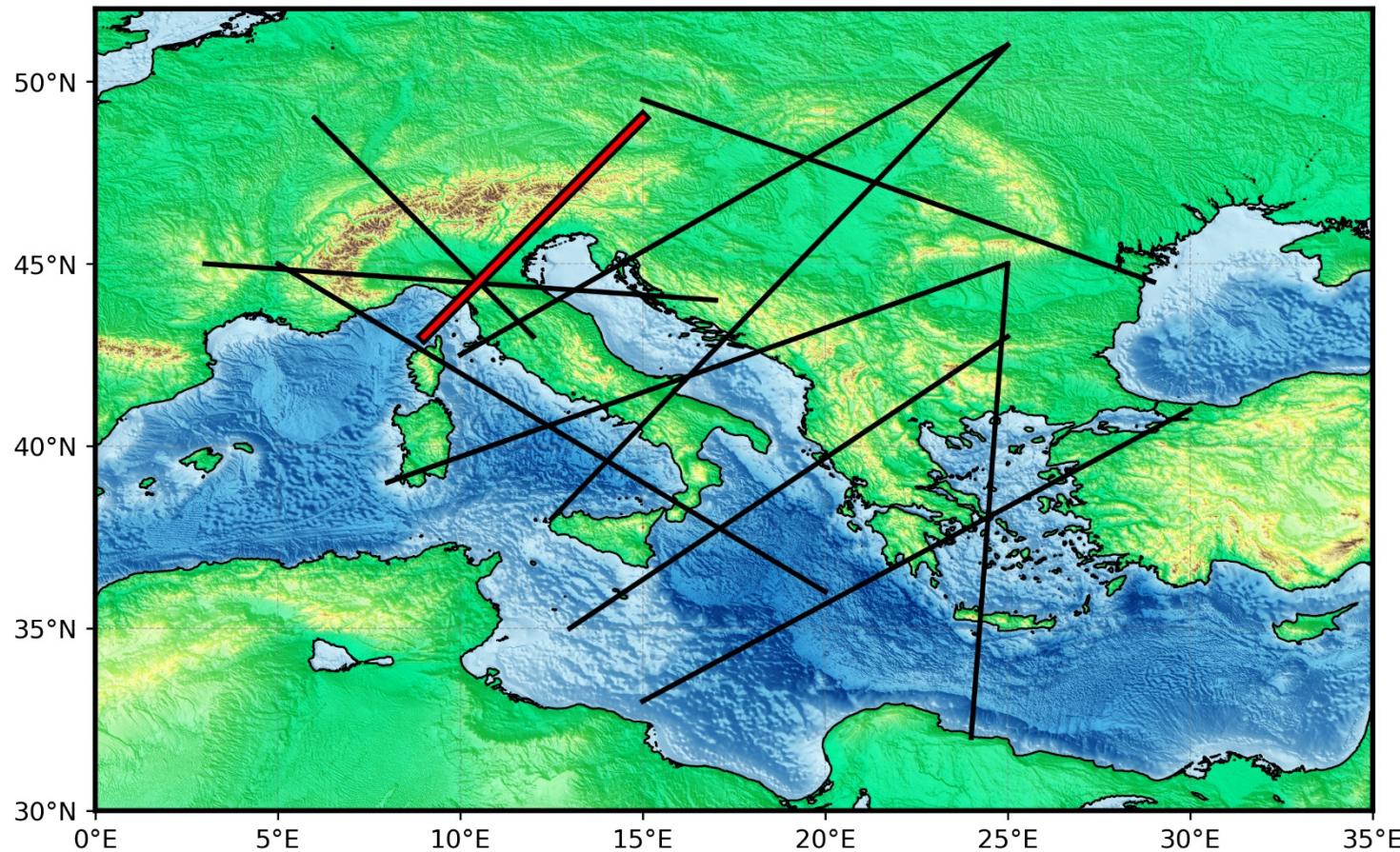


<https://juliageodynamics.github.io/GeophysicalModelGenerator.jl/dev/>

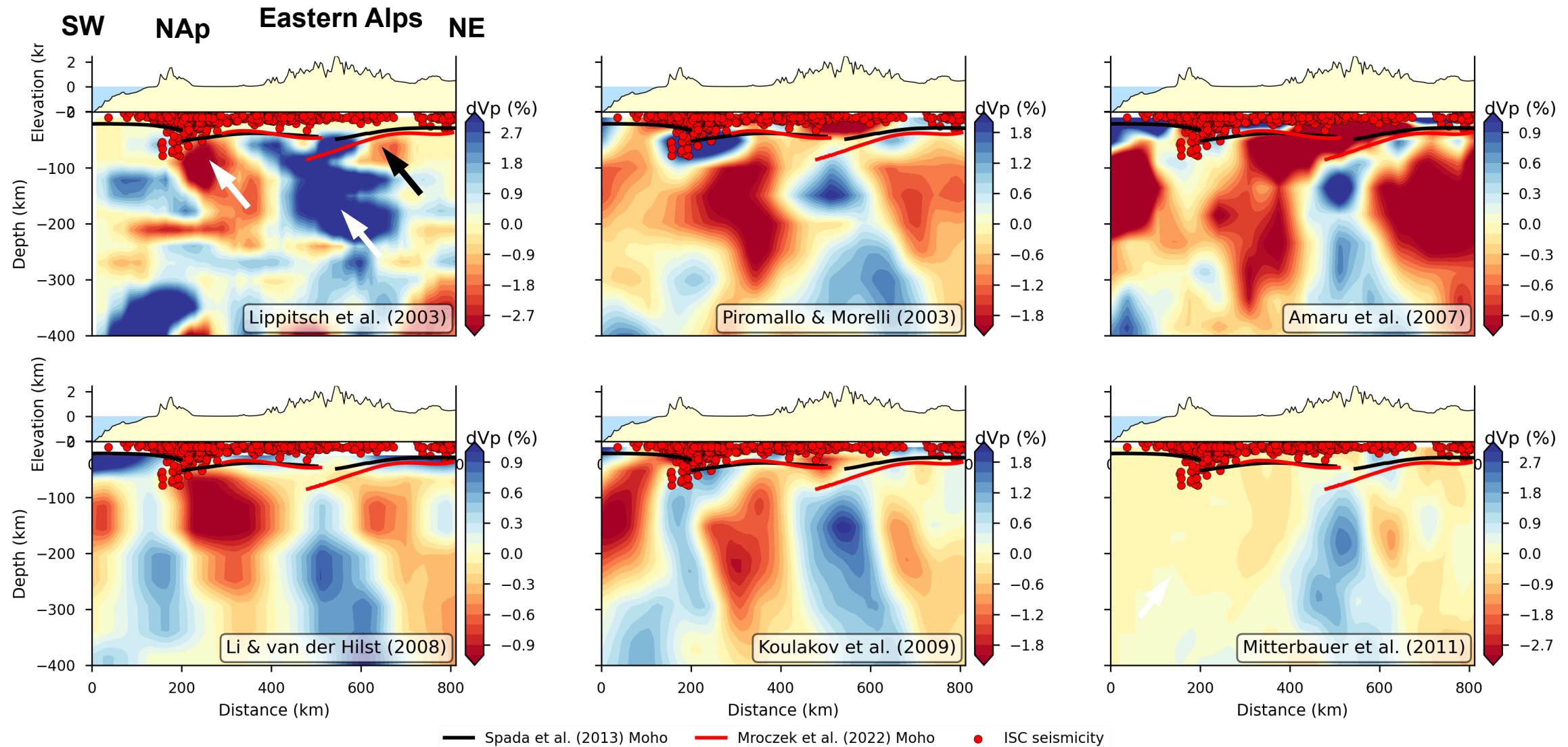


M. Thielmann, B. Kaus

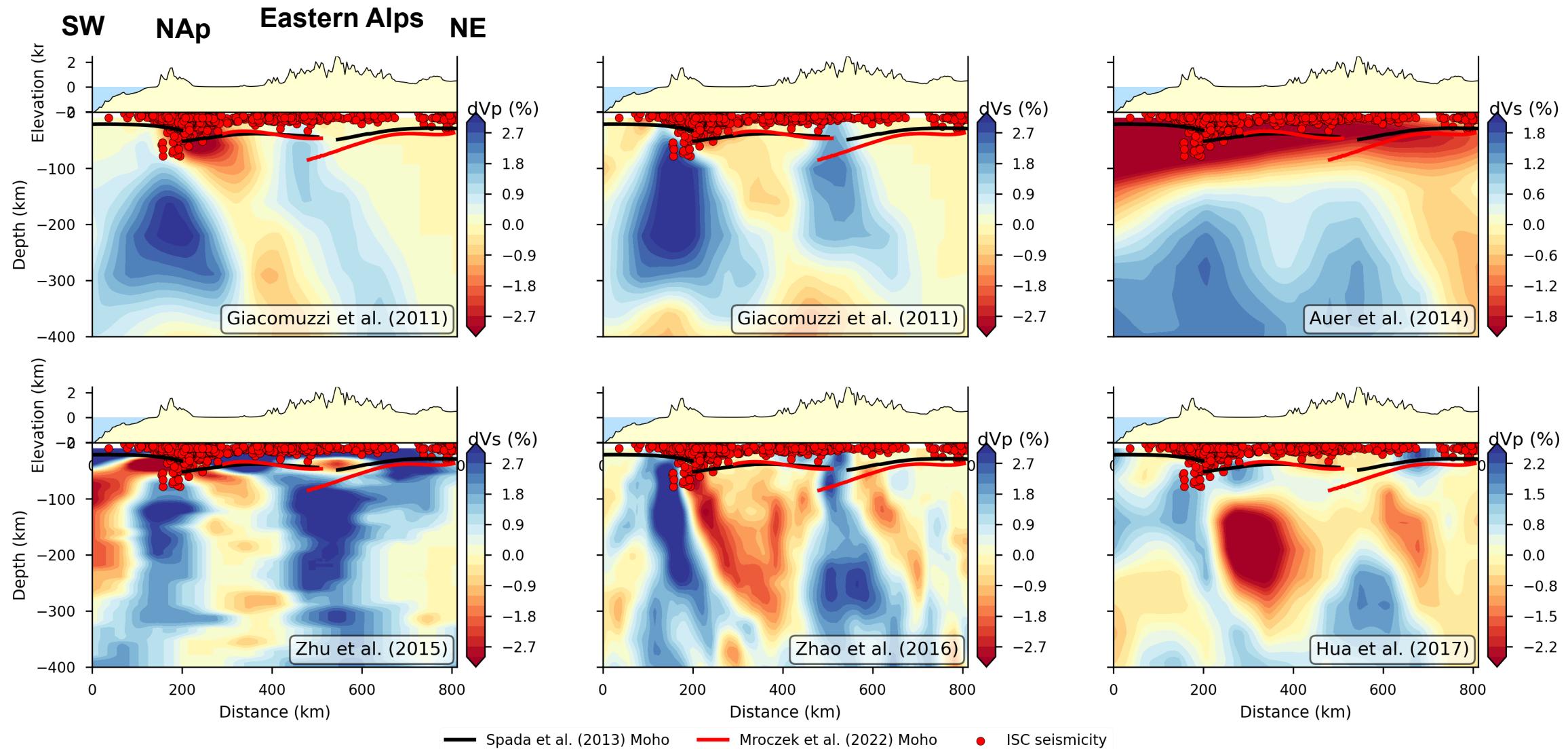
Profile 1: Northern Apennines & Eastern Alps



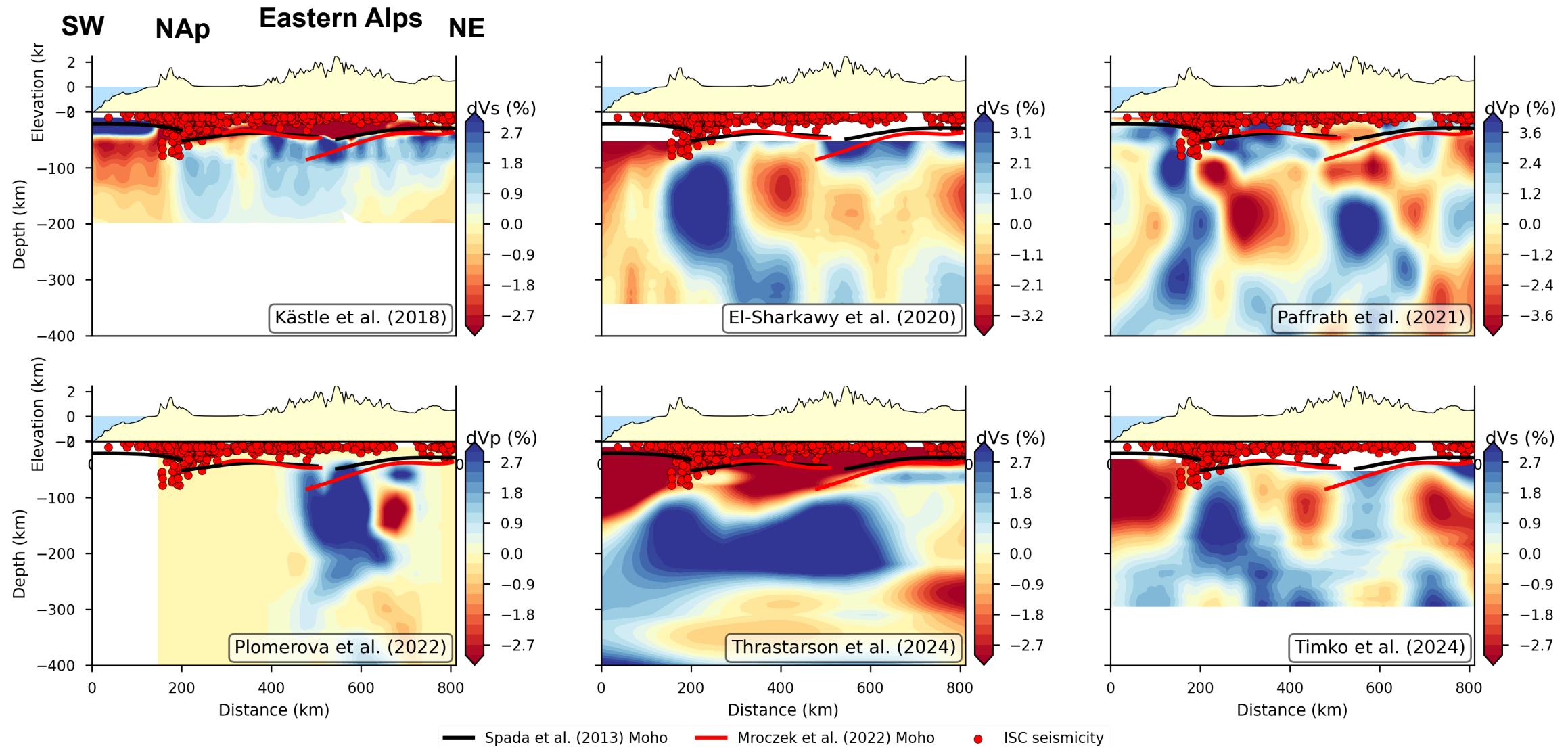
Profile 1: Northern Apennines & Eastern Alps



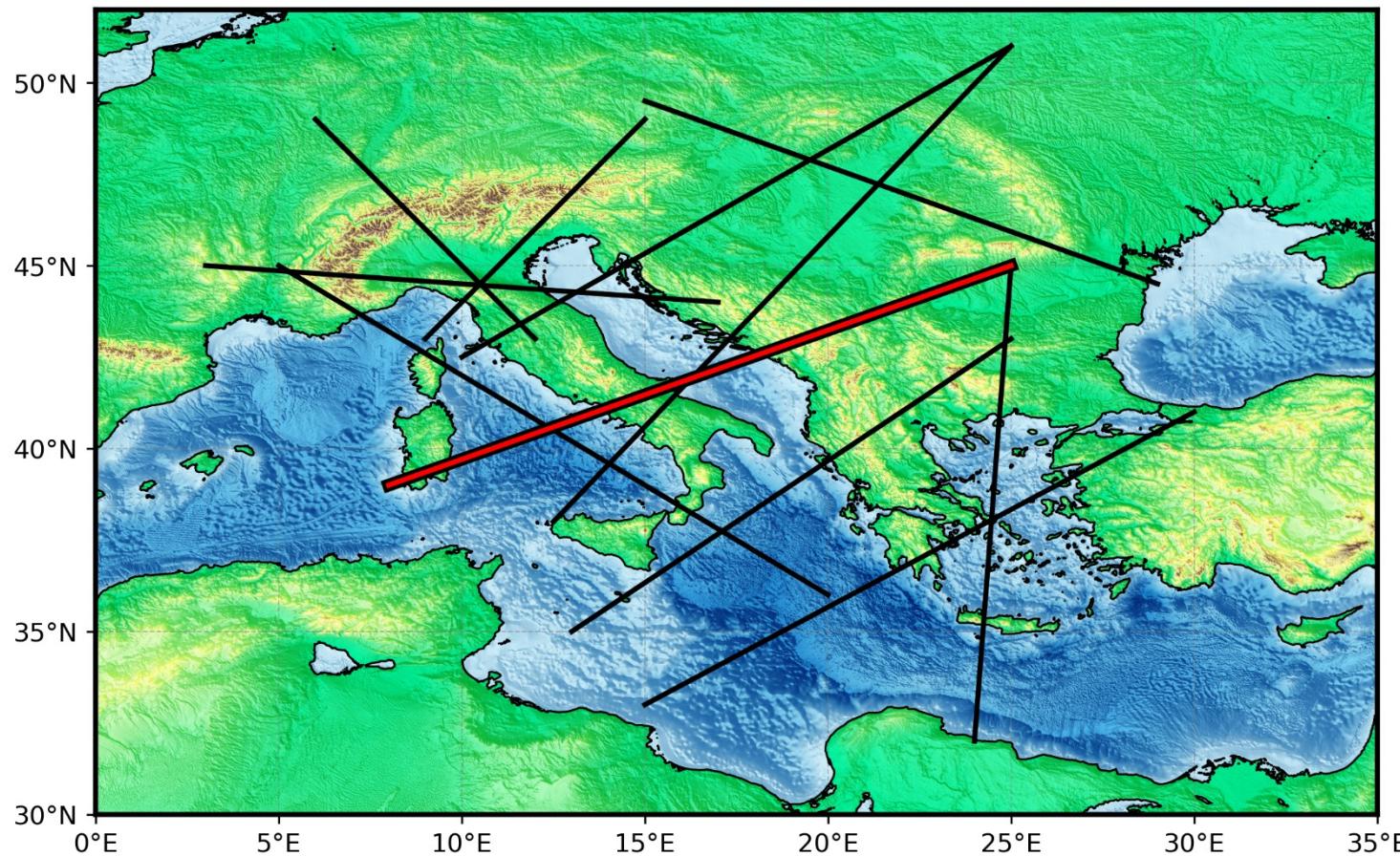
Profile 1: Northern Apennines & Eastern Alps



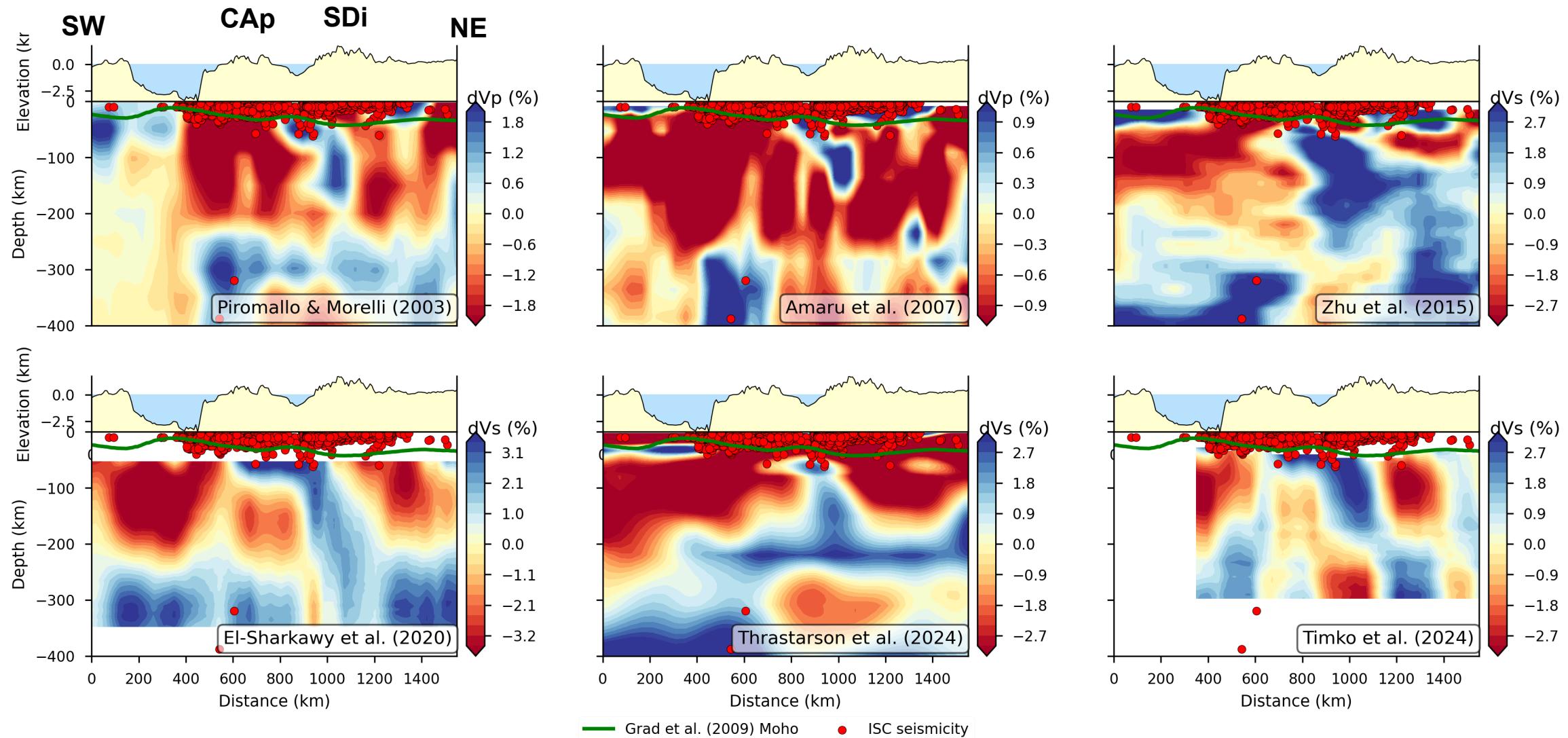
Profile 1: Northern Apennines & Eastern Alps



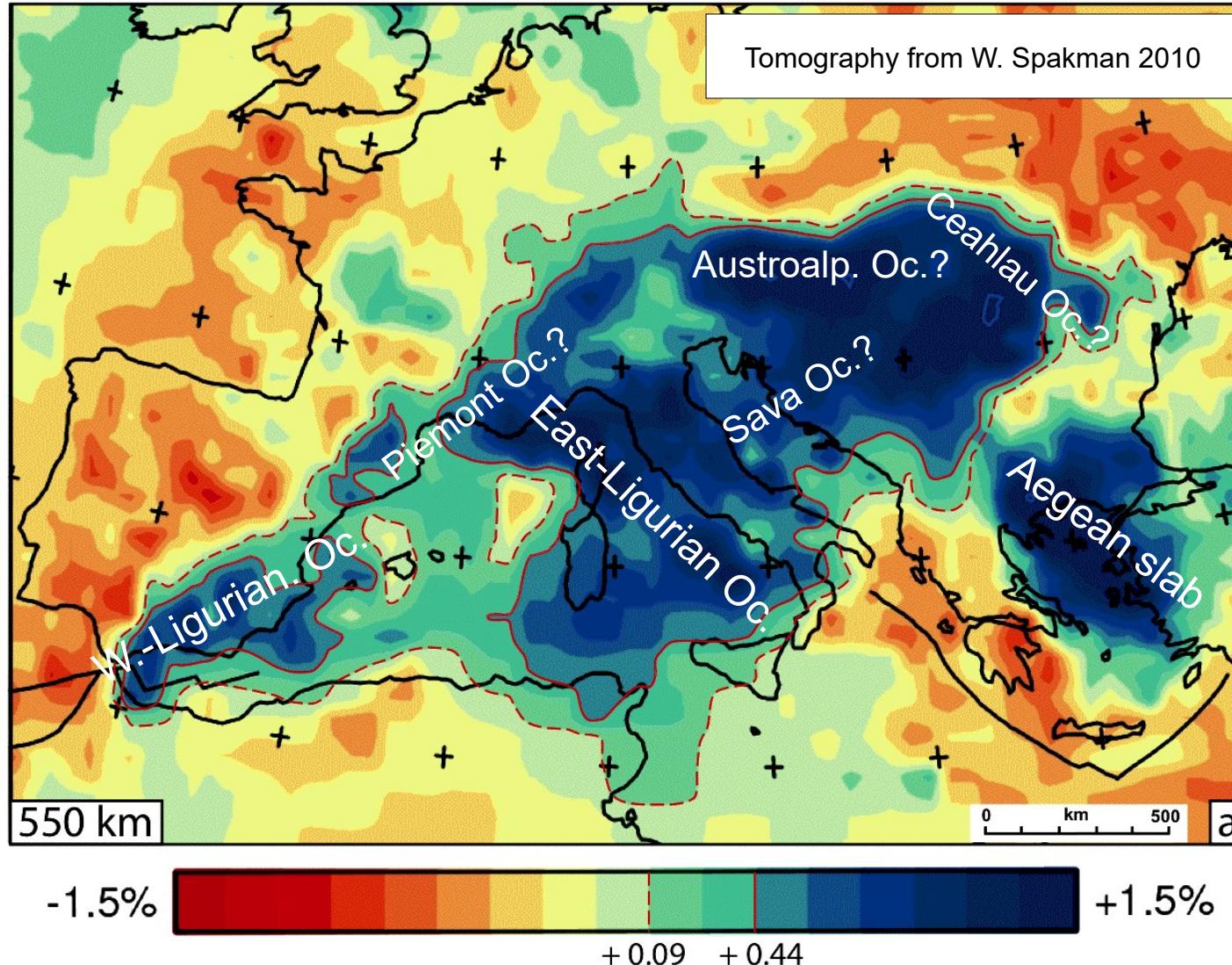
Profile 6: C. Apennines & S. Dinarides



Profile 6: C. Apennines & S. Dinarides

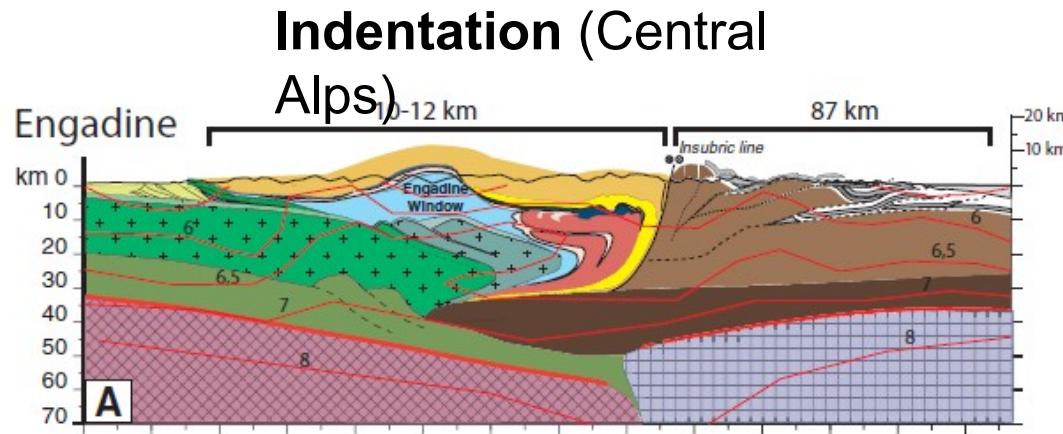


Properties of the mantle transition zone

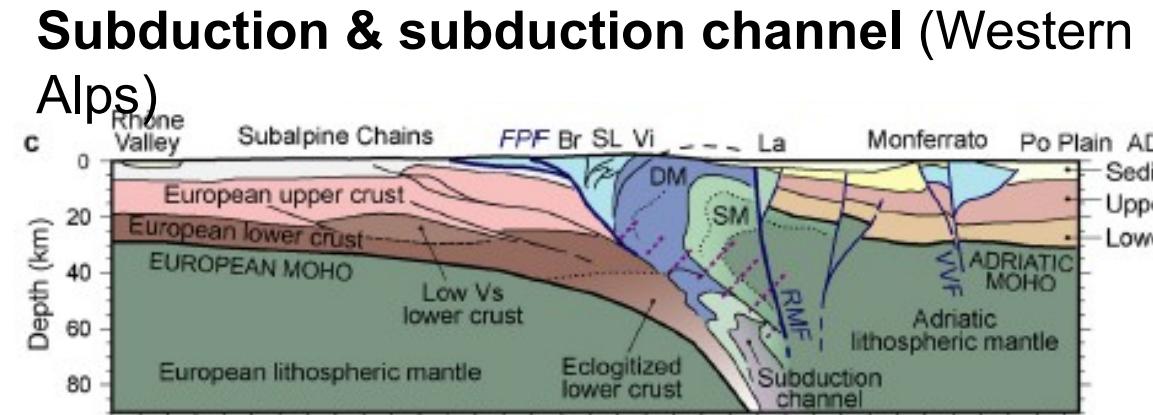


- characterize MTZ heterogeneities
- constrain changes in mineralogical composition, thermal state, and water content
- relation to subduction history, magmatism and volcanism
- controls on the depth of mantle convection

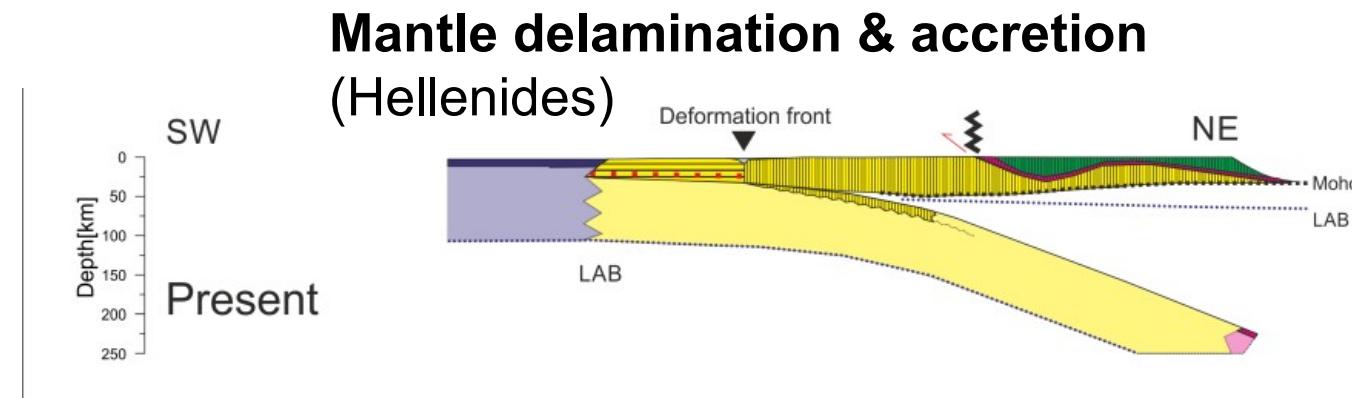
Properties of the crust: conceptional models



Rosenberg, Kissling (2013)

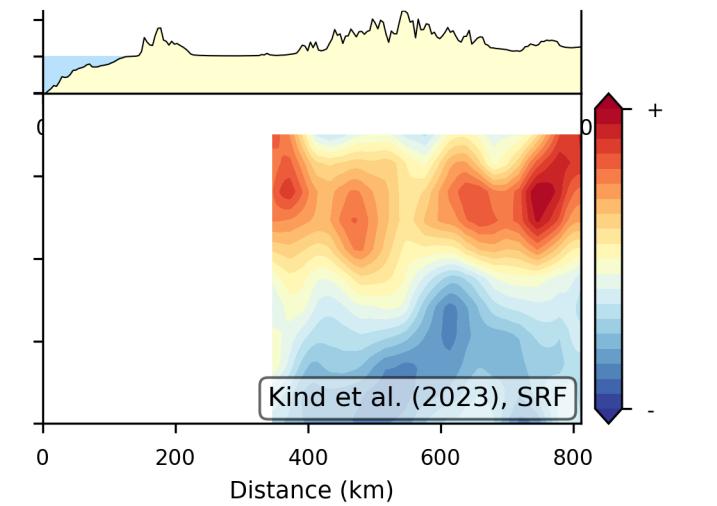
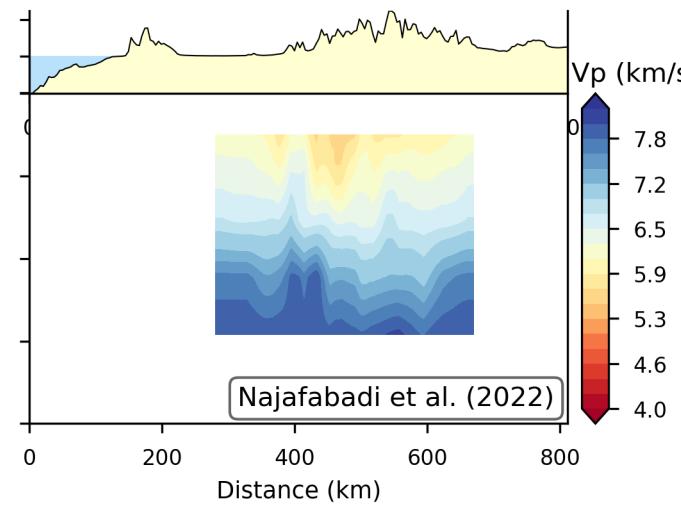
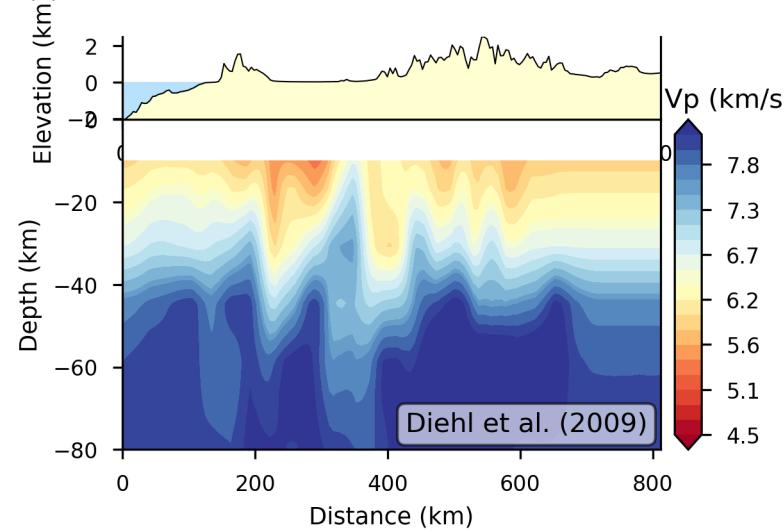
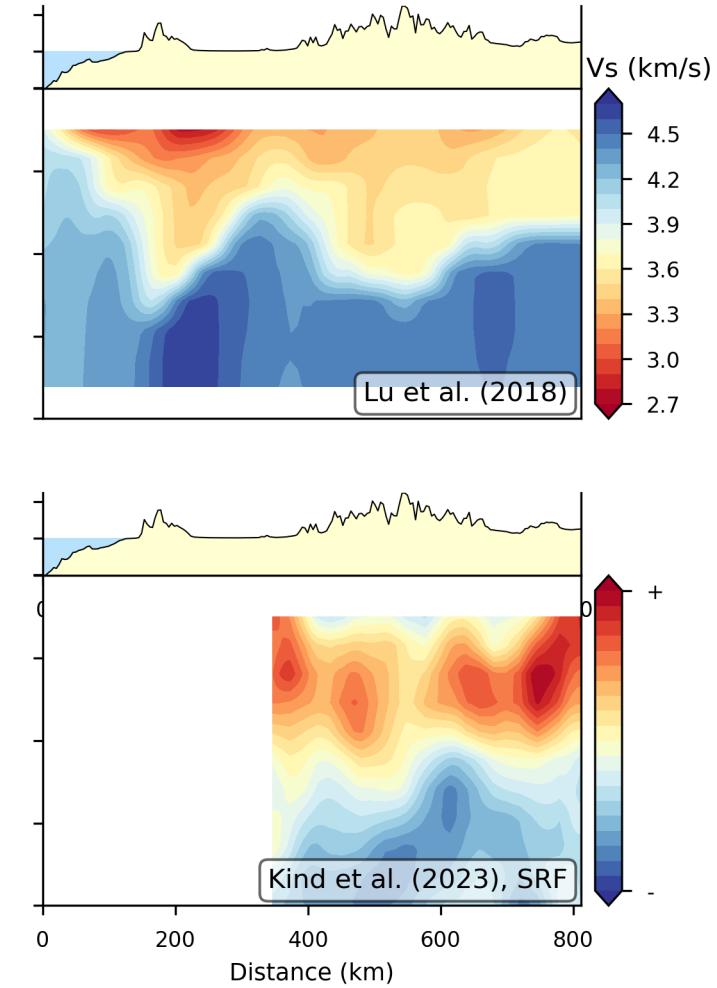
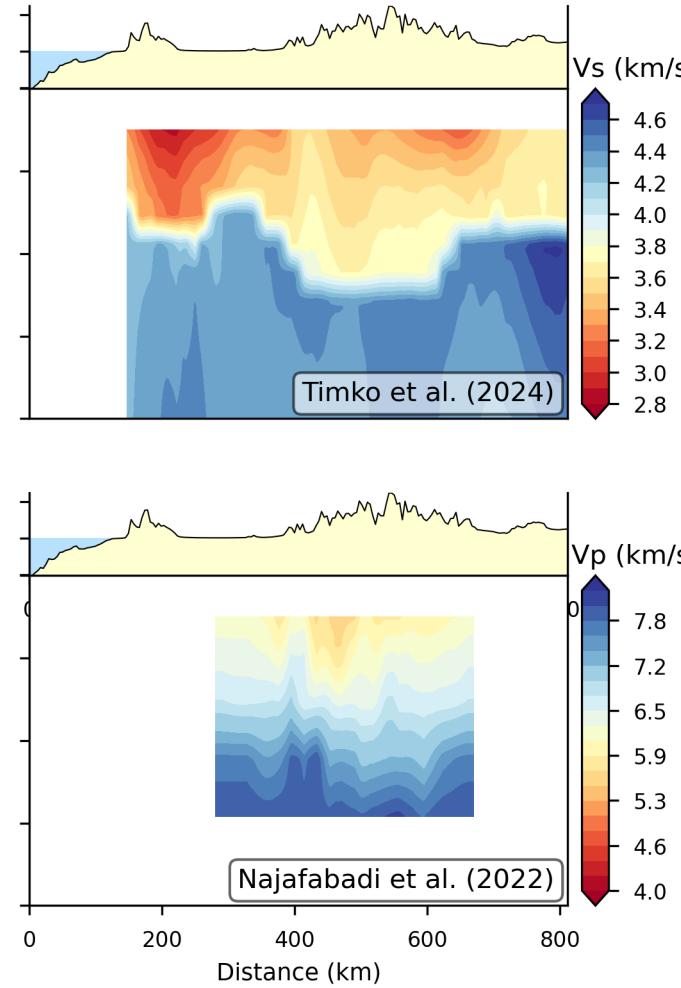
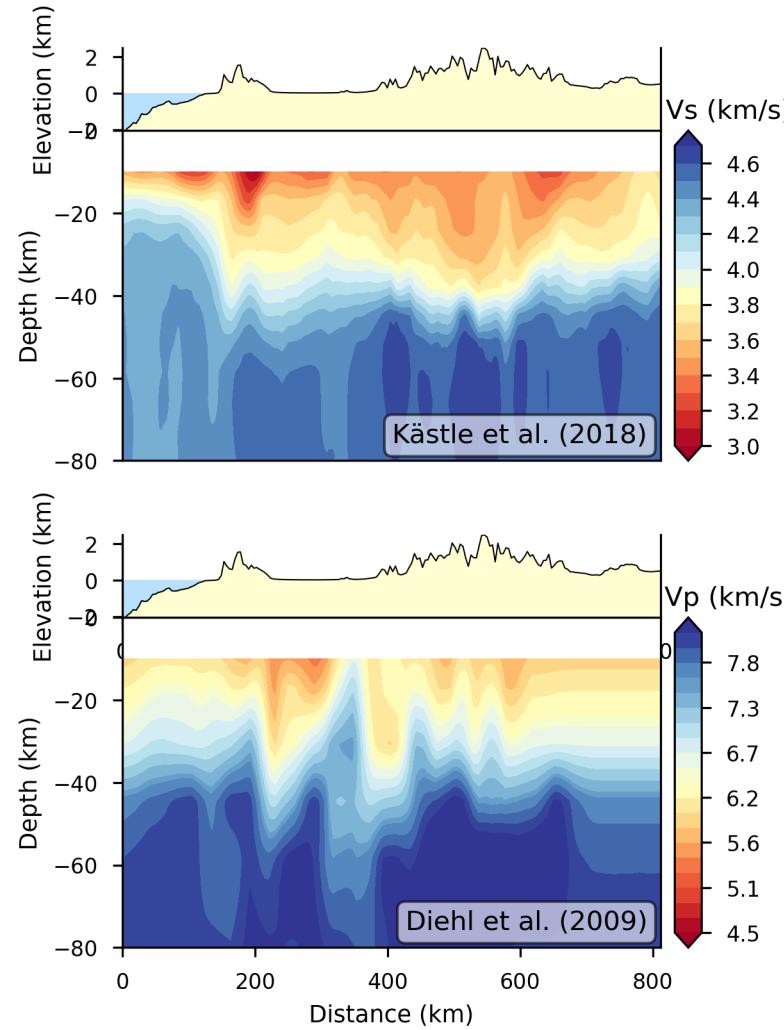


Paul et al. (2022)

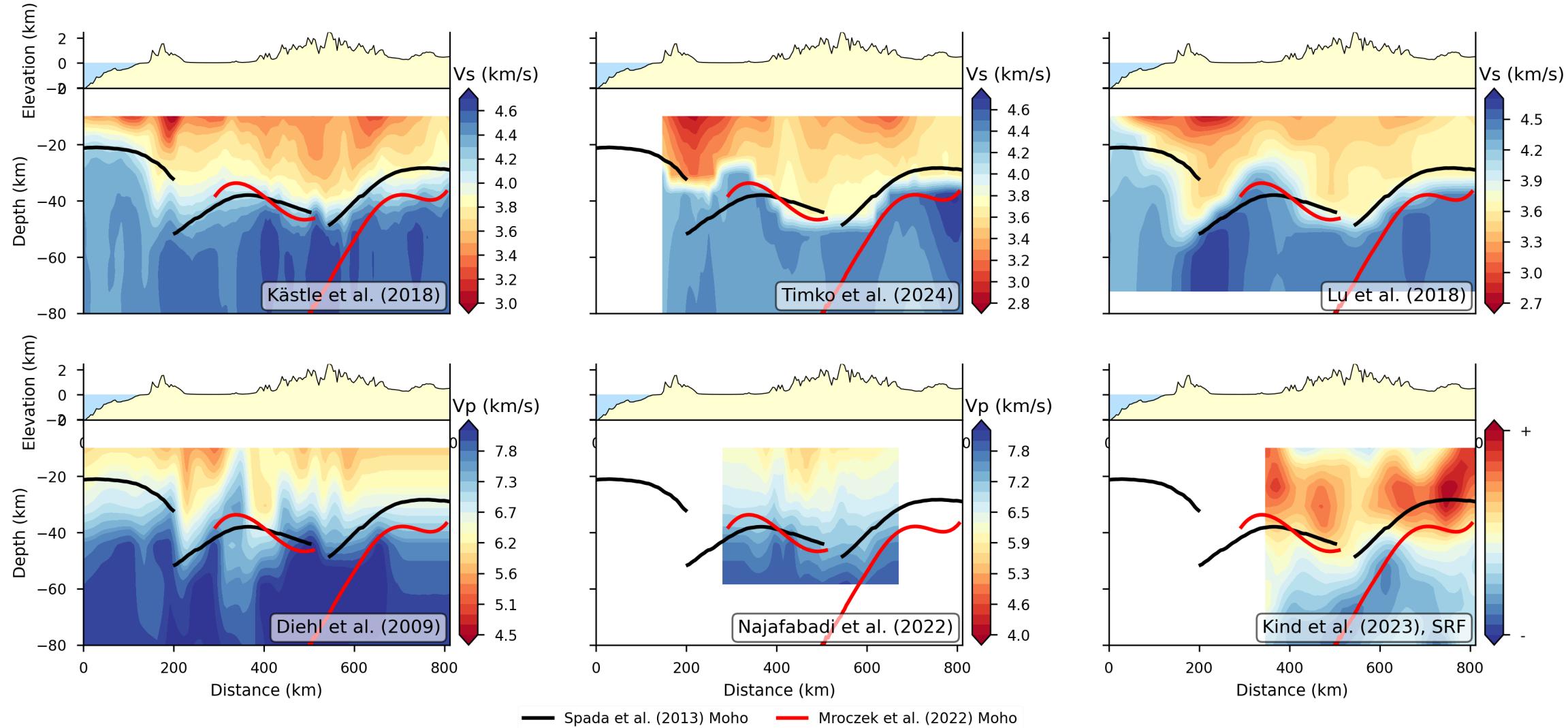


Bocchini et al. (2018)

Crust? (profile 1, Eastern Alps)



Crust? (profile 1, Eastern Alps)



Missing observations:

- Tomographic models?
- Seismicity?
- Receiver functions?
- Crustal models?

Optimizing the Geophysical Model Generator

Picking Slabs:

- Contact: thomas.meier@ifg.uni-kiel.de, amr.elsharkawy@ifg.uni-kiel.de

Comparing crustal models:

- Contact: irene.molinari@ingv.it, irene.menichelli@ingv.it

Publications

First publication:

- describing the AdriaArray initiative and the AdriaArray seismic network
- Authors: representatives of all members & colleagues who contributed essentially to the establishment and operations of the AdriaArray seismic network (as agreed by the AASG Steering Committee)

Authorlist of other publications:

- Active participants who contributed substantially to the research
- Recommendation: followed by 'AdriaArray Seismology Group'

Acknowledgements:

- AdriaArray Seismology Group is mentioned
- link to the AdriaArray web page is given

References:

- list of Digital Object Identifiers (DOIs) referring to the contributing networks and/or pools of temporary stations

Special volume in 'Annales of Geophysics'

Recent large-scale temporary passive seismic experiments in the Central Mediterranean: deployment and data quality

Guest editors: Irene Molinari, Gergana Georgieva, Petr Kolínský, Thomas Meier

Annales of Geophysics: diamond open access journal (free of charges)

27 submissions: accepted or under review

Future activities

- Data availability, metadata curation
- CRG ,Engineering Seismology': call to fill station information
- Various CRG activities
- COST Action?
- 7th AdriaArray Workshop 2026

7th AdriaArray Workshop 2026

Local organizer: D. Kalmar, I. Kovacs (HUN-REN, Institute of Earth Physics and Space Science, Hungary)

Sopron, Ligneum (Hungary)

Dates: 17/03-20/03 2026



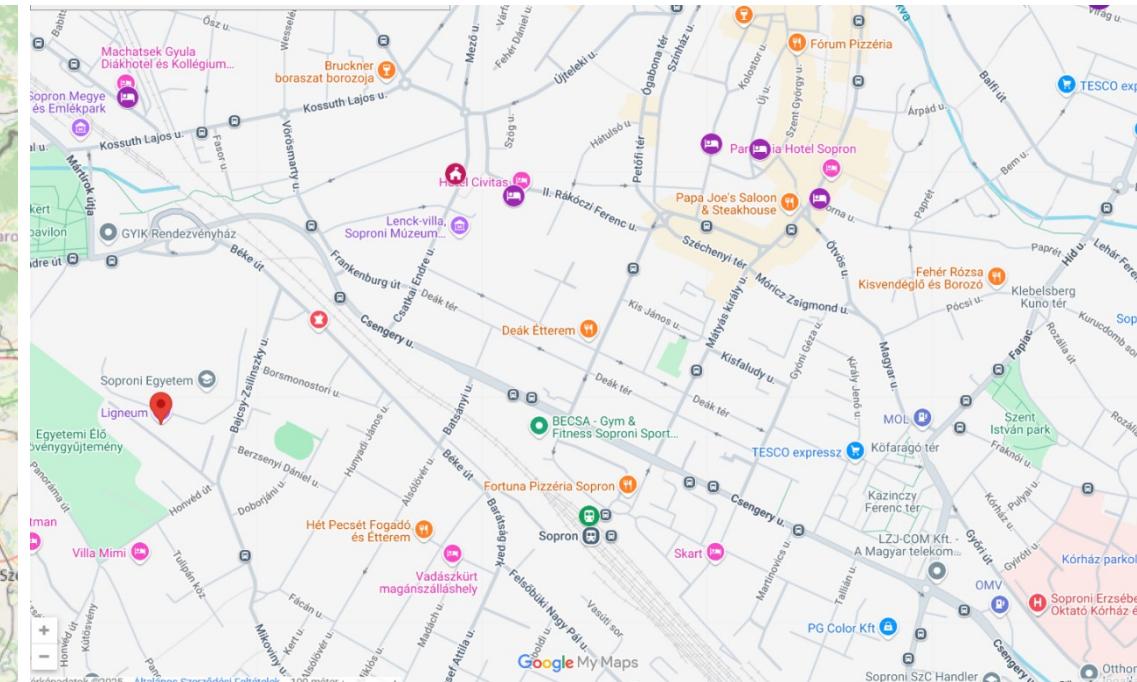
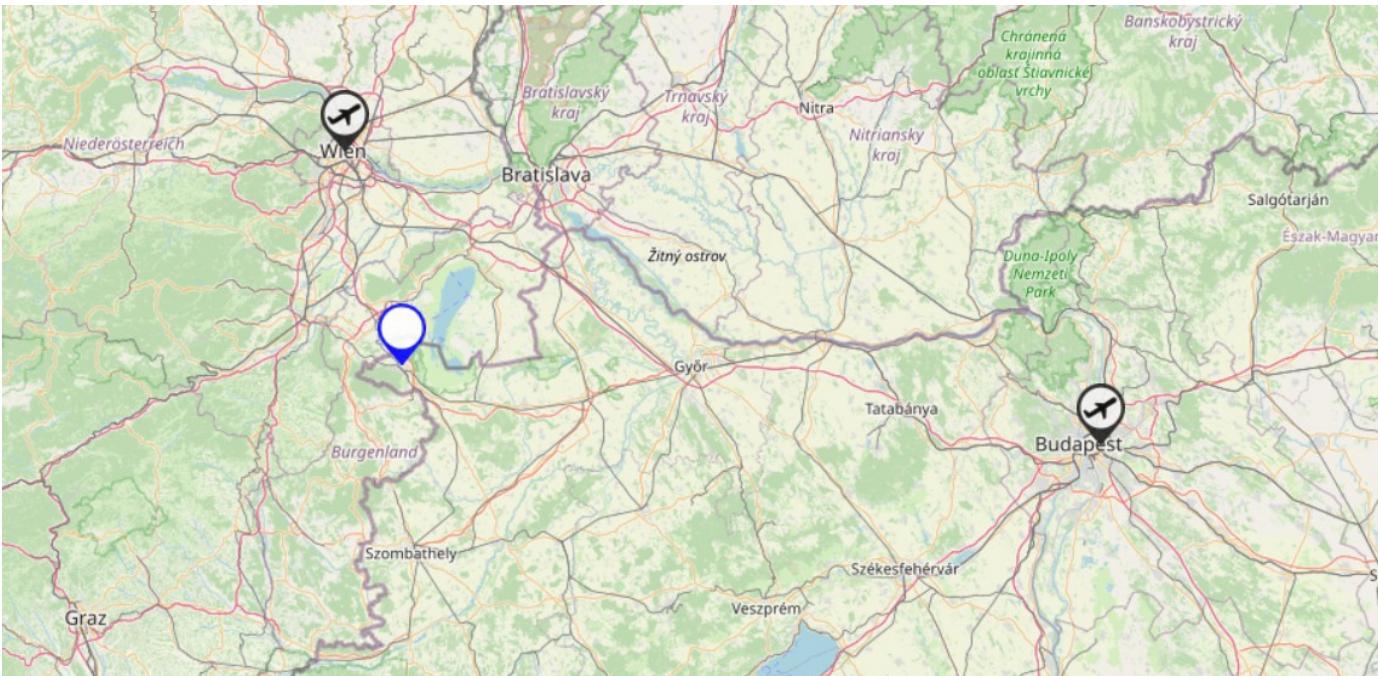


7th AdriaArray Workshop 2026

Local organizer: D. Kalmar, I. Kovacs (HUN-REN, Institute of Earth Physics and Space Science, Hungary)

Sopron, Ligneum (Hungary)

Dates: 17/03-20/03 2026



Collaborative Research Groups (CRGs)

CRGs:

- Data processing & research
- Suggested by participants (since 2023): topics, chairs, first activities of 8 CRGs
- To be approved by the Steering Committee
- Work independently
- Report on activities at the AdASG Workshops
- Consist of participants of at least two countries
- Coordination of individual CRGs: experienced researcher + early career scientist if possible
- Members may change
- May be established at the beginning of the experiment or later

Collaborative Research Group

,Body wave tomography'

Chairs:

Claudia Piromallo (claudia.piromallo@ingv.it),

Pasquale De Gori (pasquale.degori@ingv.it),

Clement Esteve (clement.esteve@univie.ac.at)

Activities:

- Manual and automated picking, evaluation of quality
- One-day Workshop 'Automated and manual picking of body wave phases' to be held on September 22 in Corfu (Greece) at the Ionian University on Sunday before the opening of the 39th General Assembly of the ESC (ESC2024)
- Test of inversion methods
- Resolution tests

Collaborative Research Group

‘Shear-wave splitting and anisotropy’

Chairs:

Silvia Pondrelli (silvia.pondrelli@ingv.it),

Ayoub Kaviani (kaviani@geophysik.uni-frankfurt.de)

Activities:

- Collection of previous shear-wave splitting measurements
- Benchmarking of methods & training
- New shear-wave splitting measurements
- Depth & joint inversions

Chairs:

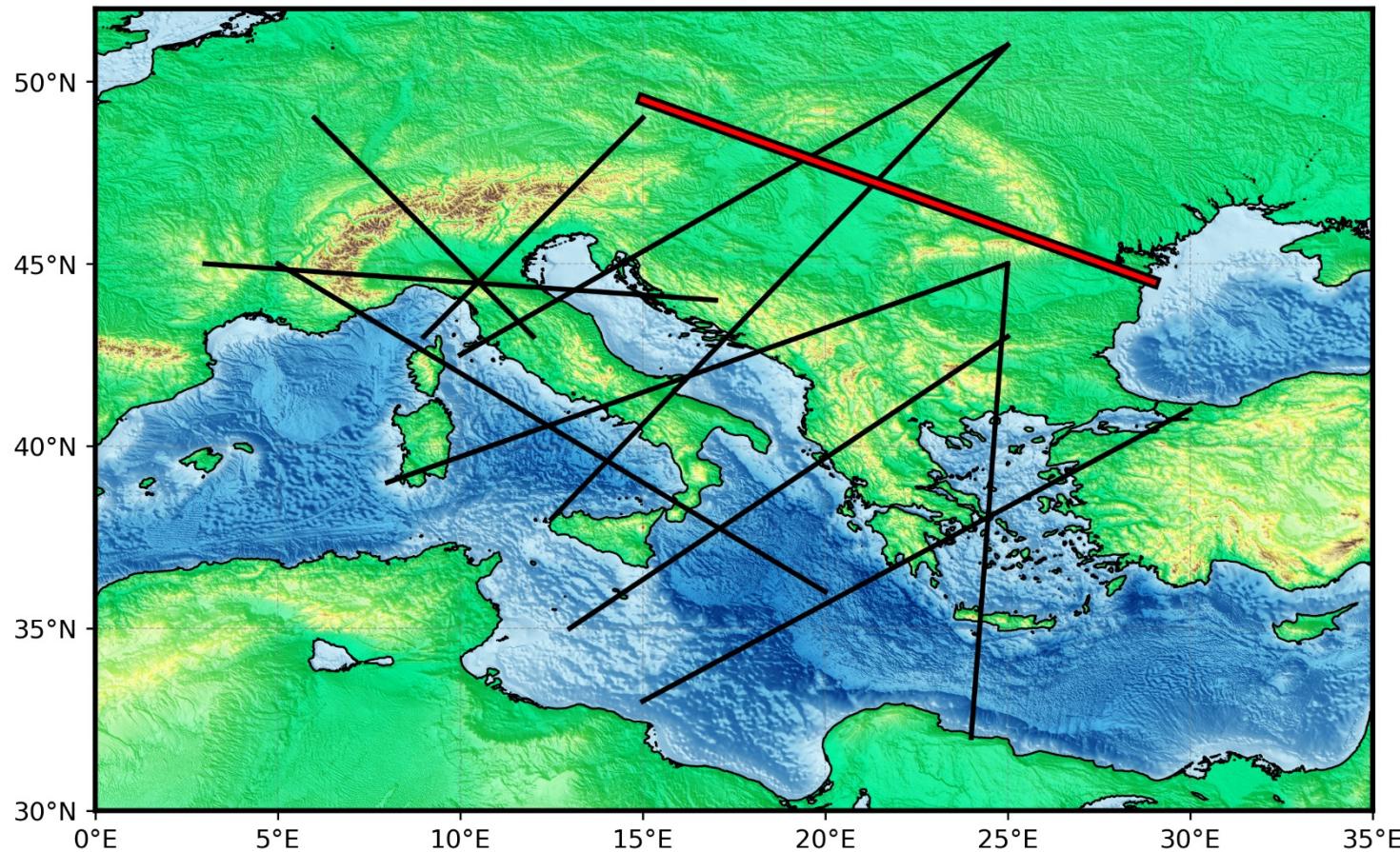
Henk Keers (henk.keers@uib.no),

Sebastien Chevrot (sebastien.chevrot@get.omp.eu)

Activities:

- Review existing forward modelling methods
- Benchmarking existing codes & training
- Forward modelling using synthetic model
- Application of inversion tools

Profile 7: W. Carpathians & SE Carpathians



Profile 7: W. Carpathians & SE Carpathians

