



Abstracts of the Annual AlpArray and 4D-MB Scientific Meeting, Bad Hofgastein 2023

Integrated records of tectonic and climate interactions in the Northern Alpine Foreland Basin sedimentary architecture

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Dating the youngest deformation in the Alps with ESR thermochronometry

Valentina Argante, Sumiko Tsukamoto, David C. Tanner, Christoph von Hagke, Christian Brandes

The Alps Paleoelevation and Paleoclimate Experiment: Reconstructing Eastward Propagation of Surface Uplift in the Alps (REAL)

Armelle Ballian, Daniel Boateng, Sebastian G. Mutz, Maud J.M. Meijers, Katharina Methner, Andreas Mulch, Todd Ehlers

Miocene (23–13 Ma) continental paleotemperature record from the northern Mediterranean region (Digne-Valensole Basin, SE France) within a global climatic framework

Armelle Ballian, Maud J.M. Meijers, Katharina Methner, Isabelle Cojan, Damien Huyghe, Jens Fiebig, Andreas Mulch

Subduction and continental collision in the Eastern Mediterranean during the closure of the Tethyan gateway

Thorsten W. Becker, Eivind O. Straume, Claudio Faccenna, Bernhard Steinberger, Andrea Sembroni, Zohar Gvirtzman

Synergistic effects of diachronous surface uplift and global climate change on the isotopic composition of meteoric waters: implications on paleoelevation estimates across the European Alps

Daniel Boateng, Sebastian G. Mutz, Armelle Ballian, Maud J. M. Meijers, Katharina Methner, Andreas Mulch, Todd A. Ehlers

What AlpArray tells us about stress and water resources under the Alpine Region

G. Bokelmann, Y. Lu, Y. Aiman, R. Kramer



A comprehensive high resolution 3D P- and S-wave velocity model for the Alpine mountain chain using local earthquake data: Constraining crustal structure, lithologies and mountain-building processes

Benedikt Braszus, Andreas Rietbrock, Christian Haberland, Trond Ryberg

Combining low-temperature thermochronology with 3-D probabilistic kinematic modeling including uncertainties in the Eastern Alps

Sofia Brisson, Josefine Ziegler, Christoph von Hagke, Florian Wellmann

Deformation in the Greiner Shear Zone – Pfitsch Valley, Southwestern Tauern Window

Bryce Carr, Gregor Facius, Rüdiger Kilian, Hannah Pomella, Thorsten Nagel, Michael Stipp

Pseudotachylites along the Pustertal-Gailtal-Line, eastern Periadriatic Fault system, Austria

Muriel Bühlhoff, Erick Prince, Christoph Grützner and Kamil Ustaszewski

Investigations of the Oligocene-Miocene opening of the Ligurian Basin using amphibious refraction seismic data

A. Dannowski, H. Kopp, I. Grevemeyer, D. Lange, M. Thorwart, G. Caielli, R. de Franco, and MSM cruise participants

Surface Responses to Subducting Slab Detachment in Small Convergent Mountain Ranges

Paul R. Eizenhöfer

Constraining the near-surface response to lithospheric reorientation: Structural thermochronology along AlpArray geophysical transects

Paul R. Eizenhöfer, Christoph Glotzbach, Jonas Kley, Todd A. Ehlers

Surface Wavefield Tomography of the Alpine Region to Constrain Slab Geometries, Lithospheric Deformation, and Asthenospheric Flow

Amr El-Sharkawy, Marcel Tesch, Manuel Ditz, PIs: Thomas Meier, Wolfgang Friederich, Jörg Ebbing

Identifying Main Lithospheric Structures in the Eastern Alpine Domain by Joint Inversion of Receiver Function and Surface Wave Measurements for Seismic Anisotropy

Amr El-Sharkawy, Mate Timko, Xiaohui Yuan, PIs: Thomas Meier, Georg Rumpker, Rainer Kind, Mark Handy



Signals of slab breakoff- and tearing in the stratigraphic architecture of a foreland basin

Lucas H.J. Eskens, Nevena Andrić-Tomašević, A. Piccolo, M. Thielmann, B. Claussmann, M. Lejri, Todd A. Ehlers

Constraining the geodynamic evolution of the Alps with sedimentary provenance and detrital thermochronometer data, II. Detrital thermochronology

Sarah Falkowski, Christoph Glotzbach, Laura Stutenbecker, Daniela Krieg, Ann-Kathrin Maier, and Todd A. Ehlers

Recognizing salt-tectonics and the need for re-assessing strike-slip displacements in the Northern Calcareous Alps: Implications for lateral orogenic extrusion

Oscar Fernandez, Bernhard Grasemann

UNIBRA / DSEBRA – the German seismological contribution to AlpArray

Antje Schlömer, Wolfgang Friederich, Michael Korn, Thomas Meier, Georg Rümpker, Frederik Tilmann, Christine Thomas, Joachim Wassermann

Eclogite dating and subduction zones in the Alps

Nikolaus Froitzheim, Matthias Hauke

Deformation during exhumation of Cretaceous high pressure units of the Eastern Alps

Niko Froitzheim, Ruth Keppler

Deriving the exhumation history of the Alps with thermochronological data

Christoph Glotzbach, Sarah Falkowski, Paul Eizenhöfer, Todd Ehlers,

Does gravity modelling justify a rifted "Ligurian Basin"?

H.-J. Götze, R. Strehlau, A. Dannowski, J. Bott, A. Kumar, M. Scheck-Wenderoth

Evolution of a Fossil Subduction Zone: Insights from the Tauern Window, Eastern Alps

Philip Groß, Jan Pleuger, Timm John, Mark Handy

Active Tectonics of the Alps-Dinarides junction

Christoph Grützner, Petra Jamšek Rupnik, Klaus Reicherter, Kamil Ustaszewski, Blaž Vičič, Friedhelm von Blanckenburg, Marko Vrabec, Hella Wittmann



Active Tectonics of the Alps-Dinarides junction – what have we learned?

Christoph Grützner

Local earthquake tomography in the Eastern and eastern Southern Alps using Swath D data

Christian Haberland

Role of the Giudicarie Belt and eastern Southern Alps in Adriatic Indentation

Mark R. Handy, Eline Le Breton, Christian Haberland, Peter J. McPhee, Azam Jozi Najafabadi, Vincent Verwater, Vincenzo Picotti

A new 4D model of Alpine orogenesis based on AlpArray

Mark R. Handy, Peter J. McPhee, Eline Le Breton, members of the 4D-MB and AlpArray Groups

The impact of the Bohemian Spur on the cooling and exhumation pattern of the Eastern Alpine wedge

Bianca Heberer, Bernhard Salcher, Gabor Tari, Godfrid Wessely, István Dunkl, Reinhard Sachsenhofer, Michael Wagneich, Christoph von Hagke

The SWATH-D seismological network in the Eastern Alps

Benjamin Heit, Luigia Cristiano, Christian Haberland, Frederik Tilmann, Damiano Pesaresi, Yan Jia, Susanne Hemmleb, Martin Haxter, Thomas Zieke, Karl-Heinz Jaekl, Antje Schloemer, Michael Weber

A geological 3D-model of Austria

Benjamin Huet, Clemens Porpaczy, Esther Hintersberger, Martin Reiser, Thomas Fuhrmann

Kinematics and rifting processes of the Liguro-Provençal Basin, Western Mediterranean

Alex Jensen, Eline Le Breton, Sascha Brune, Anke Dannowski, Dietrich Lange, Louisa Murray-Bergquist, Heidrun Kopp

Petrophysical properties across scales and compositions

Timm John, Sascha Zertani, Jan Pleuger, Frederik Tilmann, Johannes C. Vrijmoed, Torgeir B. Andersen, Loic Labrousse

Constraints on Crustal Structure in the Eastern and eastern Southern Alps

Azam Jozi Najafabadi, Christian Haberland, Mark Handy, Eline Le Breton, Michael Weber



Imaging the Alpine crust with ambient-noise tomography: Linking surface observations to deep structures

Emanuel D. Kästle

Advances in imaging the Alpine crust and mantle

Emanuel D. Kästle, Marcel Paffrath

3D geodynamic modelling of the present-day and long-term deformation of the Alps and Adria

Boris Kaus, Christian Schuler, Georg Reuber, Eline Le Breton

Pustertal-Mölltal-Gailtal-Drautal – Periadriatic Fault activity revealed by ruined buildings

Miklos Kazmer, Krzysztof Gaidzik

Elastic anisotropies of deformed crustal rocks in the Alps

Ruth Keppler, Michael Schmidtke, Michael Stipp, Nikolaus Froitzheim

Sp converted waves reveal the structure of the lithosphere below the Alps and their northern foreland

Rainer Kind, Stefan M. Schmid, Felix Schneider, Thomas Meier, Xiaohui Yuan, Ben Heit, Christian Schiffer and the AlpArray and SWATH-D Working Groups

Devonian to Permian intrusions in the Zentralgneis Supersuite of the eastern Tauern Window constrained by U-Pb zircon geochronology and geochemistry

Chiara Költringer, Benjamin Huet, Ralf Schuster, Christoph Iglseder, David A. Schneider

AdriaArray – a passive seismic experiment to study plate deformation in the central Mediterranean: Status in September 2023

Petr Kolínský, Thomas Meier, and the AdriaArray Seismology Group

Ligurian Ocean Bottom Seismology and Tectonics Research (LOBSTER)

Heidrun Kopp, Dietrich Lange, Anke Dannowski, Martin Thorwart, Ingo Grevemeyer



The Alps Paleoelevation and Paleoclimate Experiment (APE): Neogene Paleoelevation and Paleoclimate of the Central Alps

Emilija Krsnik, Svetlana Botsyun, Katharina Methner, Sebastian G. Mutz, Todd Ehlers, Andreas Mulch

Anisotropy and XKS-splitting from geodynamic models of double subduction: Testing the limits of interpretation

J. P. Kruse, G. Rumpker, F. Link, T. Duretz, H. Schmeling

Role of lithospheric-scale geological heterogeneity in continental lithosphere dynamics

Ajay Kumar, Mauro Cacace, Magdalena Scheck-Wenderoth

DEFORM – Deformation patterns in relation to the deep configuration of the lithosphere of the Alps and their forelands

Ajay Kumar, Denise Degen, Mauro Cacace, Magdalena Scheck-Wenderoth, Judith Bott, Hans-Jürgen Götze, Boris Kaus

Anisotropy along a N-S profile of mica rich lithologies in the western Tauern Window (Eastern Alps, Austria)

Dustin Lang, Rebecca Kuehn, Rüdiger Kilian, Michael Stipp

Early Miocene tectono-sedimentary shift in the eastern North Alpine Foreland Basin and its relation to changes in tectonic style in the Eastern Alps

Eline Le Breton, Anne Bernhardt, Robert Neumeister, Claudia Heismann, Arthur Borzi, Julian Hülscher, Richard Sanders, Patrick Grunert, Mark R. Handy, Peter McPhee

Stress transfer and Quaternary faulting in the northern Alpine foreland

Mader, S., Reicherter, K., Ritter, J. and the AlpArray Working Group

Investigating the post-collisional reorganization of the Eastern Alps using a 4D reconstruction

Peter J. McPhee, Mark R. Handy, Eline Le Breton

Slabs in the Alpine region: inferences down to 300 km depth from surface wave tomography and receiver functions

Thomas Meier, Amr El-Sharkawy, Ben Heit, Emanuel Kästle, Rainer Kind, Stefan Mroczek, Mate Timko, Frederik Tilmann, Xiaohui Yuan



Reconstructing Neogene surface uplift of the Alps: Integrating stable isotope paleoaltimetry and paleoclimate modelling

Maud J.M. Meijers & Sebastian G. Mutz

Present-day kinematics of the Southern Eastern Alps

Sabrina Metzger, Milan Lazecký

Applying scattered wave tomography and joint inversion of high density (SWATH D) geophysical and petrophysical datasets to unravel Eastern Alpine crustal structure

Frederik Tilmann, Wolfgang Friederich, Timm John, Jan Pleuger, Stefan Mroczek, Anne Mohr

Resolving the Eastern Alpine puzzle: Illumination of crustal structure with receiver functions and ambient noise autocorrelations

Stefan Mroczek, Frederik Tilmann, Jan Pleuger, Xiaohui Yuan, Ben Heit, the SWATH-D Working Group, and the AlpArray Working Group

Joint inversion of seismic data for temperature and lithology in the Eastern Alps

Stefan Mroczek, Frederik Tilmann, Sascha Zertani, Emanuel Kästle, and Timm John

The Potential and Limitations of 2D Seismic Experiments for 3D Tomography

L. Murray-Bergquist, A. Dannowski, D. Lange, H. Kopp, M. Thorwart

Imaging structure and geometry of Alpine slabs by full waveform inversion of teleseismic body waves

Marcel Paffrath, Johannes Stampa, Wolfgang Friederich, Thomas Meier, Boris Kaus

Seismotectonics of the Eastern Alps: New insights from earthquake studies within 4D-MB

Gesa Petersen, Laurens Hofman, Simone Cesca, Jörn Kummerow, Thomas Plenefisch, Joachim Wassermann

Reflection of mantle flow in the tectonics of Europe: stress, strain, and induced seismic anisotropy.

Alexey Petrunin

Slab detachment dynamics: Insights from 0D to 3D numerical experiments

Andrea Piccolo, Marcel Thielmann, Arne Spang



The evolution of a thrust belt within a continental indenter: Investigating the internal deformation of the Dolomites Indenter (Southern European Alps) using low-temperature thermochronology

Hannah Pomella, Thomas Klotz, Anna-Katharina Sieberer, Alexandra Wzietek, István Dunkl

Quaternary Seismic Slip in the Eastern Alps: Dating Fault Gouges from the Periadriatic Fault System Using Trapped Charge Dating Methods

Erick Prince, Sumiko Tsukamoto, Christoph Grützner, Marko Vrabec, Kamil Ustaszewski

Clustered activity of Intraplate Faults: The silent and slow active faults of southern Germany

Klaus Reicherter, Joachim R.R. Ritter, Stephane Baize, Vanessa Steinritz, Sara Pena-Castellnou, Jochen Hürtgen

Paleoseismicity of the Alpine foreland: the Upper Rhine Graben

Klaus Reicherter, Joachim R.R. Ritter, Jochen Hürtgen, Sara Pena-Castellnou

Rapid Miocene Exhumation to the East of the Tauern Window

Johannes Rembe, Edward R. Sobel, Willemijn S. M. T. van Kooten, Susanne Schneider

2-D kinematic restoration of the western Tauern Window using thermochronological constraints

Julia Rudmann, David Colin Tanner, Michael Stipp, Hannah Pomella, Christian Brandes

Layered anisotropy and mantle flow beneath AlpArray from shear-wave splitting

Georg Rumpker, Frederik Link

INTEGRATE-Integrated 3D structural, thermal, gravity and rheological modeling of the Alps and their forelands

Magdalena Scheck-Wenderoth, Judith Bott, Cameron Spooner, Jörg Ebbing, Hans-Jürgen Götze, Josef Sebera

Glacial and erosional contributions to Late Quaternary uplift of the European Alps (GEOLQUEA)

Dirk Scherler, Helen Werner, Ricarda Winkelmann, Guillaume Juvet, Volker Klemann



UNIBRA / DSEBRA – the German seismological contribution to AlpArray

Antje Schlömer, Wolfgang Friederich, Michael Korn, Thomas Meier, Georg Rumpker, Frederik Tilmann, Christine Thomas, Joachim Wassermann

The seismically active Mt. Hochstaufen, Bad Reichenhall (Germany)

Antje Schlömer, Joachim Wassermann, Sabrina Metzger

The Southern Alps east of the Giudicarie Belt: Did they really act as an indenter?

Stefan M. Schmid

Investigating the plate motion of the Adriatic microplate by 3D thermomechanical modelling

Christian Schuler, Boris Kaus, Eline Le Breton, Nicolas Riel

Control of inherited structures and mechanical heterogeneities on the internal deformation of the Dolomites Indenter, eastern Southern Alps: a multi-scale analogue modelling study

Anna-Katharina Sieberer, Ernst Willingshofer, Thomas Klotz, Hugo Ortner, Hannah Pomella

Seismic wavefield visualizations with AlpArray and AdriaArray

Johannes Stampa, Thomas Meier

Processes and repercussions of slab detachment

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The Geophysical Model Generator: A tool to unify and interpret geophysical datasets

Marcel Thielmann, Boris J.P. Kaus, Thomas Meier

Basin inversion: reactivated rift structures in the central Ligurian Sea revealed using ocean bottom seismometers

Martin Thorwart, Anke Dannowski, Ingo Grevemeyer, Dietrich Lange, Heidrun Kopp

Foreland dynamics as a measure of mountain building processes

Christoph von Hagke, Elco Luijendijk, Sarah Louis, Sofia Brisson, Kevin Frings, Florian Wellmann



A petrological and geochronological study of the Koralpe-Saualpe-Pohorje (KSP) Complex (Eastern Alps)

Iris Wannhoff, Jan Pleuger, Xin Zhong, Timm John, Leo J. Millonig, Axel Gerdes

Impact of spatial resolution on large-scale ice cover modeling of mountainous regions

Helen Werner, Dirk Scherler, Ricarda Winkelmann

3D crustal structure of the Ligurian Basin revealed by surface wave tomography using ocean bottom seismometer data

Felix N. Wolf, Dietrich Lange, Anke Dannowski, Martin Thorwart, Wayne Crawford, Lars Wiesenberg, Ingo Grevemeyer, Heidrun Kopp, and the AlpArrayWorking Group