

SESSION 15- Geodynamics: From Present-Day Mechanisms to Large-Scale Tectonic Evolution

Conveners

Ebru Şengül Uluocak, Çanakkale Onsekiz Mart University, Geophysical Engineering, Çanakkale, Türkiye and GFZ Helmholtz Centre for Geosciences, Potsdam, Germany (sengul@gfz.de)

Pietro Sternai, University of Milano-Bicocca, Solid Earth Geophysics, Department of Earth and Environmental Sciences, Milano, Italy (pietro.sternai@unimib.it)

Alexander Koptev, GFZ Helmholtz Centre for Geosciences, Potsdam, Germany (koptev@gfz-potsdam.de)

Pınar Büyükkapınar, GFZ Helmholtz Centre for Geosciences, Potsdam, Germany (pinar@gfz-potsdam.de)

Julia Andersen, Early Career Scientist, Department of Earth Sciences, University of Toronto, Canada (julia.andersen@mail.utoronto.ca)

Sofia-Katerina Kufner, Friedrich-Alexander-University Erlangen-Nürnberg: Erlangen, Germany (sofia.kufner@fau.de)

Emin Uluggerli, Çanakkale Onsekiz Mart University, Geophysical Engineering, Çanakkale, Türkiye (emin@comu.edu.tr)

Session Description

This session is devoted to geodynamic processes across the full spectrum of Earth's interior, from the deep mantle to the crust, and their key interactions with tectonic, biospheric, and climate systems. We solicit contributions that explore the wide spectrum of geodynamic phenomena, including but not limited to active deformation, earthquake source physics, fault system dynamics, volcanism, and lithospheric dynamics that shape tectonic behavior across plate-to-regional scales.

While the primary focus is on lithospheric and crustal dynamics, studies that clarify their connections to mantle-driven processes in a regional context are strongly encouraged. We are particularly interested in interdisciplinary research that integrates diverse datasets—such as seismological, geodetic, and geomagnetic observations—with state-of-the-art geodynamic modeling to constrain the multi-scale interactions between crustal and mantle processes across varying temporal scales.

The session aims to foster a holistic understanding through multidisciplinary approaches and advanced methodologies for analyzing, simulating, and visualizing complex geodynamic systems. Our goal is to cultivate cross-disciplinary dialogue and promote integrative perspectives on the physical mechanisms driving Earth's dynamic evolution, with a focus on how observations reveal interactions from deep mantle to shallow crustal processes. Contributions from all disciplines and career stages are welcome and encouraged.

