Universität Münster

GEOPHYSIK Uni MÜNSTER

Institut für Geophysik

Geophysikalisches Kolloquium

Wintersemester 2024/2025

Montag, 25.11.2024

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(Petro)physical imaging of magma systems

Much of the knowledge of how the asthenosphere contributes to lithospheric deformation and the generation of magmatic systems comes from geophysical imaging and petrological investigations. However, an open question remains: how can we link observed geophysical anomalies with the petrological constraints and the dynamics of the crust, mantle, and magmatic systems? Seismic tomography models are typically interpreted qualitatively using interdisciplinary evidence and spatial correlations. Yet, in magma systems, anomalies in seismic tomography models may not provide reliable evidence of melt generation regions and storage volumes, as their interpretation is nonunique and remains problematic. Here, I will present first the trade-off these models create in our understanding of magma systems. Then, I will show recent advancements in our ability to model lithospheric and magma systems with thermo-mechanical modelling, targeting specifically which geophysical responses we are able to create synthetically and which we are not. Finally, I will show the results of a new Bayesian tomographic modelling procedure that retrieves petrophysical parameters used in modelling magma systems from geophysical responses and petrological data. I will focus on how much these models help us better understand magma storage and migration at volcanoes. At the same time, I will discuss the extensive theoretical and experimental improvements we still need to achieve so that these models express reality and uncertainty in magmatic systems.

Das Kolloquium findet um 16:00 Uhr im Seminarraum GEO 315, Corrensstr. 24, 48149 Münster statt. Alle an dem Thema Interessierten sind hierzu herzlich eingeladen.

Die Dozenten des Instituts für Geophysik