Westfälische
Wilhelms-Universität
Münster

GEOPHYSIK
WWU MÜNSTER

Institut für Geophysik

Geophysikalisches Kolloquium
Wintersemester 2016/2017

Montag, 12. Dezember 2016

Dr. Matthew J. Comeau
Institut für Geophysik
Westf. Wilhelms-Universität Münster

Using Magnetotellurics to study surface uplift

I will show both past and present work which share the common link of constraining surface uplift and crustal deformation models using magnetotelluric (MT) data. MT data are useful because they map subsurface electrical resistivity using natural electromagnetic signals, and are particularly sensitive to fluids and magma in the crust.

The Altiplano-Puna plateau in South America is a high plateau located above a subduction zone which underwent uplift and pervasive andesitic magmatism during the past 10 Myrs. Geodetic data show that a region of southern Bolivia is currently being uplifted at ~15 mm/yr, with the deformation centered on Volcán Uturuncu. Other studies give evidence of a major mid-crustal magma body, and evidence for magma motion in the crust. Electrical resistivity models derived from MT data image this magma body and give constraints on geodynamic models for uplift dynamics, preferring a mid-crustal, localized, uprising melt diapir.

In contrast, the Hangai Dome in central Mongolia is a high-elevation intra-continental plateau situated far from tectonic boundaries. It too underwent uplift during the past 10 Myrs but is characterized by dispersed, low-volume basaltic volcanism. While uplift remains small, the modern view of dynamic topography suggests that the idea of surface deformation solely by means of plate tectonics needs to be updated to include crust-mantle interactions. Newly acquired magnetotelluric data are used to generate an electrical resistivity model of the crust and upper mantle in this region. These constrain geodynamic models to those that require a low-heat flux asthenospheric upwelling that thermally modifies the lithospheric mantle to explain both uplift and volcanism in the Hangai region.

Das Kolloquium findet um **16 Uhr c. t.** im **Seminarraum F**, Wilhelm-Klemm-Str. 10,
48149 Münster statt.
Alle an dem Thema Interessierten sind hierzu herzlich eingeladen.

Die Dozenten des Instituts für Geophysik