

# Quantifying processes and bridging disciplines

## ESSENTIALS



### Michael Dietze

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## APPOINTMENTS & EDUCATION

2016 — 2016	NIOZ Remote office phase
2013 — ...	GFZ Potsdam PostDoc project on Environmental Seismology. Project Management of the Horizon2020 ITN SUBITOP.
2008 — 2008	CICESE Ensenada Research stay
2007 — 2013	TU Dresden PhD project on stone pavements in deserts. BA studies in Physics. Teaching and PostDoc brain storming phase.
2001 — 2007	TU Dresden Undergraduate and graduate studies in Geography

## THEMES

Earth surface processes decisively shape our planet. It is these processes my research is devoted to. The landforms they create and modify are the main conveyors of information about driving factors and boundary conditions. This information may be approached by measuring key parameters of the modern process regime or by identifying and quantifying the sedimentologic record created by the processes. My motivation is to bridge these fields in a quantitative way by integrating methods from other disciplines.

Pursuing these goals involves development of new or the modification of existing conceptual, analytical, measurement and computational approaches. I often do this with the intention to share the methodological outcomes with a wide community. Hence, the software R has become a central part of significant portions of my work.

My main methodological focus is on environmental seismology, i.e. the study of seismic signals emitted by Earth surface processes. I work on building a reference catalogue of the seismic properties of key Earth surface processes from around the globe to provide base data for robust real-time process monitoring at the catchment scale. Further research interests grade into statistical and numerical modelling of sediment deposits in many different climatic and topographic regimes to decipher their evolutionary history.

My idea of teaching is also based on bridging disciplines, in particular geosciences and physics/mathematics. I deliberately work on fostering skills to communicate ideas between these disciplines by combining practical work in classrooms, on computers, in workshops and laboratories and of course in the field.

## SERVICE

### Duties

2016: Organisation committee EGU Galileo conference on environmental seismology.  
2011—2015: Speaker German Young Geomorphologists, then member of advisory board.  
2010: Colloquium coordinator TU Dresden

### Convener

2013—...: EGU sessions with conceptual focus, session on experiment-model linkages.  
2014: AK Geomorphologie.

### Reviewer

Catena, Earth Surface Processes and Landforms, Journal of Arid Lands, Quaternary International, Nature Scientific Reports, Annals of Geomorphology.  
  
10 MSc and 1 PhD theses.

## TEACHING & SUPERVISION

### Courses

Seminar mineral and rock analysis, Seminar & Field Course soil geography, Seminar Geoinformatics Seminar Geomorphology, Seminar Geodata analysis, Seminar Slope deposits, Seminar Mineral analytics, Tutorial digital data management.

### Field trips

Erzgebirge and Saxony, SW USA (three months in total), "Ambas Californias", Kyrgyzstan, Canary Islands, Czech Republic to Baltic Sea.

### Supervision

8 MSc theses  
15 BA theses  
... Undergraduate theses (too many to count)

## EXPERIENCES

2016	Horizon2020 ITN management Seismic detection and localisation of alpine rockfalls
2015	Environmental seismology (catalogue of Earth surface processes) Wider applications of end-member modelling (runoff separation, varve compositions, spectrograms, marine and fluvial sediments)
2014	Environmental seismology (validation cases, software developed) Further R-packages created (eseis, grainsize, geomorphometry) Co-ordination grain-size lab installation
2013	Development R-package EMMAgeo (end-member modelling) Accretionary deposits under stone pavements, Jordan
2012	Development R-package RCHILD (integration of CHILD to R) Contribution to R-package Luminescence (dating of sediments)
2011	Experiments on clast orientation patterns from water flows Landscape evolution and accretionary deposits, Lanzarote Geomorphic change detection from historic geomorphic maps
2010	Landscape evolution Valle de Barrancas Blancas, Atacama Desert Workshop advanced teaching and education at universities
2009	Statistic analyses of stone pavement clast orientations Laboratory experiments on vesicular soil structure formation Founding member of the Fundacion Cambugán
2008	Clay mineralogy of Lake Yoa, Chad First identification of a chromium bearing smectite in Germany
2007	Foundation luminescence laboratory TU Dresden Mineralogy of cenozoic weathering products near Dresden Clay mineral composition of dust deposits, Canary Islands
2006 and prior	Research assistant at different institutes (Geography, Geology, Soil Science. Organisation seminar palaeo- and environmental magnetism. Internships at GFZ and Saxon Academy of Science.

## INVITATIONS

### Talks

DRI Reno, FACSIMILE workshop, University Potsdam, GFZ Potsdam, University Greifswald, University Bayreuth, University Freiberg, University Leipzig, University Halle, University Dresden

### Research/Teaching

TU Munich, DRI Reno, University of Trier, University of Aachen, University of Bayreuth, CICESE Mexico, Aicha/Eichstätt, LED Mannheim, University Cologne.

## HONORS

2013 Dissertation Reward, AK Geomorphologie

## FUNDING

2014 Research expedition funding (Helmholtz, 4000 €).

2014 RLum.Network. M. Dietze is network partner (DFG, 24105.00 €)

2008 International conference funding (DFG, 990 €)

## PUBLICATIONS

2016 22 | Turowski, JM, M Dietze, A Schöpa, A Burtin, N Hovius (2016). Vom Flüstern, Raunen und Grollen der Landschaft. Seismische Methoden in der Geomorphologie. System Earth (GFZ-Journal) 16-1. 56-62.

21 | Dietze, M, E Dietze, J Lomax, M Fuchs, A Kleber, SG Wells (2016). Environmental history recorded in aeolian deposits under stone pavements, Mojave Desert, USA. Quaternary Research 85. 4-16.

20 | Dietze, M, S Kreutzer, C Burow, MC Fuchs, M Fischer, C Schmidt (2016). The abanico plot: Visualising chronometric data with individual standard errors. Quaternary Geochronology 31. 12-18.

2015 19 | Fuchs, M, M Dietze, K Al-Qudah, J Lomax (2015). Dating desert pavements - First results from a challenging archive. Quaternary Geochronology. DOI: 10.1016/j.quageo.2015.01.001.

2014 18 | Fuchs, M, S Kreutzer, C Burow, M Dietze, M Fischer, C Schmidt, M Fuchs (2014). Data processing in luminescence dating analysis: An exemplary workflow using the R package 'Luminescence'. Quaternary International. DOI: doi: 10.1016/j.quaint.2014.06.034.

2013 17 | Dietze, M, S Kreutzer, MC Fuchs, C Burow, M Fischer, C Schmidt (2013). A practical guide to the R package Luminescence. Ancient TL. 11-18.

16 | Francus P, H von Suchodoletz, M Dietze, R Donner, F Bouchard, AJ Roy, M Fagot, D Verschuren, S Kröpelin (2013). Varved sediments of Lake Yoa (Ounianga Kebir, Chad) reveal progressive drying of the Sahara during the last 6.100 years. Sedimentology. DOI: 10.1111/j.1365-3091.2012.01370.x

15 | Dietze M, J Groth, A Kleber. 2013. Alignment of stone pavement clasts by unconcentrated overland flow - implications of numerical and physical modelling. Earth Surface Processes and Land-forms. DOI: 10.1002/esp.3365.

14 | Kleber, A, B Terhorst, H Bullmann, D Hülle, M Leopold, S Müller, T Raab, D Sauer, T Scholten, M Dietze, P Felix-Henningsen, J Heinrich, E-D Spies, H Thiemeyer. 2013. Chapter 2 - Subdued Mountains of Central Europe. In: Mid-Latitude Slope Deposits (Cover Beds). Developments in Sedimentology 66. 9-93.

2012 13 | Dietze M, S Bartel, M Lindner, A Kleber. 2012. Formation mechanisms and control factors of vesicular soil structure. Catena 99: 83-96.

# PUBLICATIONS

- 2012
- 12 | Kreutzer S, C Schmidt, MC Fuchs, M, Dietze, M Fischer, M Fuchs. 2012. Introducing an R package for luminescence dating analysis. *Ancient TL* 30, 1-8.
- 11 | Suchodoletz, H von, H Blanchard, A Hilgers, U Radtke, M Fuchs, M Dietze, L Zöller. 2012. TL and ESR-dating of Middle Pleistocene lava flows on Lanzarote island, Canary Islands (Spain). *Quaternary Geochronology* 9: 54-64.
- 10 | Dietze M, A Kleber. 2012. Contribution of lateral processes to stone pavement formation in deserts inferred from clast orientation patterns. *Geomorphology* 139-140: 172-187.
- 2011
- 9 | Dietze M, S Muhs, E Dietze. 2011. Ambiguities of relative age indicators on abandoned surfaces of arid environments. *Zeitschrift für Geomorphologie* 55 Suppl. 3: 49-75.
- 2010
- 8 | Dietze M, A Kleber. 2010. Characterisation and prediction of thickness and material properties of periglacial cover beds, Tharandter Wald, Germany. *Geoderma* 156: 346-356.
- 7 | Ullrich B, M Dietze, F Haubrich. 2010. New results of the bentonitisation of the Wilsdruff-Potschappel Porphyrite near Dresden (Saxony, Germany). *Geologica Saxonica* 56: 115-125.
- 2009
- 6 | Suchodoletz H von, P Kühn, U Hambach, M Dietze, L Zöller, D Faust. 2009. Loess-like and palaeosol sediments from Lanzarote (Canary Islands/Spain) - Indicators of palaeoenvironmental change during the Late Quaternary. *Palaeogeography, Palaeoclimatology, Palaeoecology* 278: 71-87.
- 2008
- 5 | Dietze M, A Kleber, B Ullrich. 2008. Investigation and modelling of material properties of periglacial layers (Tharandt Forest, Saxony, Germany). *Abhandlungen der Geologischen Bundesanstalt* 62: 39-44.
- 4 | Kleber A, M Dietze. 2008. Periglaziale Hangsedimente und Kolluvien im Tharandter Wald. *DBG-Mitteilungen* 111: 355-380.
- 2007
- 3 | Dietze M, F Haubrich, T Klinger, B Ullrich. 2007. Smectite im Porphyrit von Wurgwitz bei Dresden (Sachsen, Deutschland). *Geologica Saxonica* 52/53: 97-115.
- 2 | Faust, D, A Kleber, P Schreiber, S Meszner, D Wolf, M Dietze, F Haubold, C Hamann. 2007. Exkursionsführer zur 26. Jahrestagung des Arbeitskreises Paläopedologie in Dresden. – Deutsche Bodenkundliche Gesellschaft - Arbeitskreis Paläopedologie.
- 2006
- 1 | Faust D, A Kleber, C Lorz, P Schreiber, S Meszner, D Wolf, M Dietze, F Haubold. 2006. Löss in Sachsen - Exkursionsführer zum 32. Jahrestagung des Arbeitskreises Geomorphologie der Deutschen Geographischen Gesellschaft, Dresden.

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