

Zeeden, Christian¹; Vinnepand, Mathias¹; Radaković, Milica²; Marković, Slobodan^{2,3,4}; Gavrilov, Milivoj²; Hambach, Ulrich^{5,6}

Reconstructing past climate from Loess-Palaeosol Sequences: Challenges of calibration functions

¹Department of Rock Physics & Borehole Geophysics, Leibniz Institute for Applied Geophysics (LIAG), Stilleweg 2, 30655 Hannover, Germany;

²Department of Geography, Tourism and Hotel management, Faculty of Science, University of Novi Sad, Trg Dositeja Obradovića 3, 21000 Novi Sad, Serbia;

³Serbian Academy of Arts and Sciences, KnezMihajlova 35, 11000 Belgrade, Serbia;

⁴University of Montenegro, Cetinjska 2, 81000 Podgorica, Montenegro;

⁵Romanian Academy, Institute of Speleology, Cluj-Napoca 400006, Romania;

⁶BayCEER, University of Bayreuth, 95448 Bayreuth, Germany;

christian.zeeden@leibniz-liag.de

Loess-Palaeosol-Sequences (LPS) are widespread geoarchives connecting climate subsystems across continents. They can record paleo-environmental changes and terrestrial system responses to external forcing. Yet, our knowledge of terrestrial palaeo-climates remains incomplete, challenging the reconstruction of terrestrial environments.

To overcome this, multiple climofunctions have been suggested for qualitative and quantitative reconstruction of precipitation, temperature and aridity from LPS, and all have their theoretical concepts, special applications and come with specific limitations and challenges. Here we provide an overview of frequently applied climofunctions. In a second step, we test several rock magnetic methods for their applicability in paleosols and provide a dataset from Europe. Our results show that especially rock magnetic properties prove useful even considering small climate gradients (10s of mm/a in precipitation, less than 1°C temperature), but their general applicability seems not possible.

Session: DEUQUA Session: Terrestrial records of paleoenvironments and – climates

Keywords: loess, rock magnetism, paleoclimate reconstruction