3-year PhD project at the University of Potsdam: Crustal vertical motions, relief and drainage development at the Dinarides-Hellenides transition

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The internal zone of the northern Hellenides in Albania, Kosovo and North Macedonia is characterized by orogen-perpendicular extension, which has marked the topography and has been argued to control rapid exhumation since the late Miocene-Pliocene. In addition, the Shkoder-Peja Fault System (SPFS) in northern Albania, which forms the limit between the oblique collisional Dinarides orogen to the north and the subduction-controlled Hellenides orogen to the south, should also accommodate orogen-parallel extension and hosts some of the highest massifs of the Dinaride-Hellenide orogen in its footwall. First-order questions concerning both the dynamics and the kinematics of the Dinaride-Hellenide Transition (DHT) at the SPFS remain unanswered, including: (1) the role of the SPFS in accommodating differential motion between the Dinarides and Hellenides; (2) the temporal and kinematic relationships between range-perpendicular and range-parallel extension; (3) the onset age of the most recent phase of extension in the northern Hellenides; (4) the link between extension and exhumation; and (5) the imprint of extensional tectonics on topography and drainage patterns.

This PhD project will address these outstanding research questions by: (1) collecting new low-temperature AHe and potentially $^{4}He/^{3}He$ thermochronology data from strategic locations throughout the DHT to map out spatial / temporal patterns of exhumation and their relationship with extension; (2) integrating new and existing thermochronology data into thermo-kinematic models in order to quantitatively infer fault-motion history from the pattern of thermochronological dates; (3) establishing quantitative relationship between landscape morphology and catchment-average erosion rates from cosmogenic-nuclide data in catchments across major extensional faults. The overarching objective is to provide a well-constrained history of uplift, exhumation and extensional faulting associated with the DHT since the Late Miocene.

Funding is available, through the DFG SPP DEFORM program, for a 3-year PhD project including costs for fieldwork, analysis, conference attendance and publications. There will be an opportunity to spend some time at one of the collaborating institutes during the PhD. We are looking for motivated recently graduated MSc students in the geosciences, preferably with some experience in (and affinity with) thermochronology, tectonic geomorphology and/or numerical modelling. To apply, send a motivation letter, academic CV and addresses of two potential references to the main supervisor at: vanderbeek@uni-potsdam.de. We are looking to fill this position as quickly as possible; the deadline for applications is October 1st.

Main Supervisor: Pieter van der Beek, Universität Potsdam
Collaborators: Eline Le Breton, Université de Rennes, France;
Lorenzo Gemignani, Università di Bologna, Italy;
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