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Detrital zircon fission track thermochronology in key stratigraphic formations of the Danube system, Romania: climatic or tectonic signals?

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Recent thermochronological investigations of Romanian Carpathians, covering the Cretaceous-Quaternary exhumation and burial history of the orogen, has revealed significant constraints related to the understanding of its thermo-tectonic evolution.
Available information in the form of less constrained thermochronological ages in the orogen and its foreland might indicate that climate change caused strong variation in erosion rates and sediment fluxes post-dating the Late Miocene continental collision. Moreover, in the SE Carpathians foreland, a change in sediment supply is suggested by both classical provenance and sequence stratigraphy studies that inferred an important contribution of the Messinian Salinity Crisis event (MSC) that took place in the Eastern Paratethys.
Since the link between tectonics and climate is still a matter of debate in this sector of the Carpathians chain, one way of solving the controversy is to apply the robust zircon fission-track (ZFT) in key stratigraphic formations of the depositional area by the means of the thermochronological provenance study. The aim is to integrate the age signatures from the river drainage system as provenance markers by linking them with existing thermochronological data located in the exhumed source area of the Carpathians chain.
A large number of samples were collected in the Upper Miocene to Quaternary (9-0 Ma) deposits of the western flank of the Focsani basin, located in the SE Carpathians foreland. In order to link this intermediate basin with the active marine depositional area which is presently the Black Sea, 13 additional samples were taken from recent (<10Ka) sediments of the Danube Delta for detrital ZFT analysis. This was complemented by exhumation ages in the denuded Carpathians area.
Preliminary results suggest a key climatic control on the exhumation and erosion of the Carpathians chain during Upper Miocene–Quaternary times, with significant peak accelerations that are well correlated in space and time not only with the MSC event, but also with the Quaternary stages of enhanced climatic exhumation.

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