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New thermochronological constraints on the exhumational history at the Taiwan subduction-collision transition.

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Geological constraints helped by scarce thermochronological data suggest that exhumation in the Taiwan arc-continent collision accelerated ∼2 Myr ago, that is ∼5 Myr after the onset of the collision. A change in the kinematic boundary conditions combined or not with a redistribution of deformation within the orogenic wedge (e.g., underplating, out-of-sequence thrusting) can be proposed. Here, we aim to address this issue by providing new constraints on the cooling history of the orogen since the earliest stage of the Taiwan collision.
We present over 40 new insitu and detrital apatite and zircon fission-track ages in Southern Taiwan. Two vertical profiles were sampled on the retro- and pro-side of the wedge with an elevation range going from about ∼500 to ∼3000 m.a.s.l. and from ∼2000 to ∼3000 m.a.s.l., respectively; therefore constraining the cooling rates across the drainage divide. Although the vertical profile approach has been widely used in other active orogenic systems, it is the first time it is applied to the Taiwan orogenic wedge with such a spatial resolution. The detrital samples come from the Lingkou and Liukuei Plio-Pleistocene conglomerates formation of the Southern Taiwan Pingtung foreland basin. These conglomerates were traditionally interpreted to be the result of an increased tectonic activity during that time but the exact cause and rates of exhumation associated with them are still unknown.The combination of the insitu and detrital dataset with structural observations in the southern Central Range lead us to examine the different possible control on this erosional phase.