



Quantifying rates of detachment faulting and erosion in the central Menderes Massif (western Turkey) by thermochronology and cosmogenic ^{10}Be

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Exhumation of rocks in extensional tectonic settings results from a combination of normal faulting and erosion but the relative contribution of these processes has rarely been quantified. Here we present new low-temperature thermochronological data and the first ^{10}Be -based catchment-wide erosion rates from the Boz Dağ region in the central Menderes Massif, which has experienced NNE-SSW extension since the Miocene. The slip rate of the shallow-dipping Gediz detachment fault, which defines the northern flank of the Boz Dağ block, is 4.3 (+3.0/-1.2) mm/a, as constrained by zircon (U-Th)/He ages of ~4-2 Ma in the footwall (Buscher et al. in review with the Journal of the Geological Society, London). Apatite and zircon (U-Th)/He and fission track ages from the northern flank of the Boz Dağ block yield exhumation rates of 0.6-2 km/Ma beneath the Gediz detachment, whereas those on the southern flank are only 0.2-0.6 km/Ma. Erosion of catchments on the northern and southern flanks proceeds at rates of 80-180 and 330-460 mm/ka, respectively. This marked contrast is a combined effect of the topographic asymmetry of the Boz Dağ block and differences in rock erodibility. If these erosion rates persisted in the past, rock exhumation on the northern flank occurred predominantly by tectonic denudation, whereas rocks on the southern flank were mainly exhumed by erosion.