



Mesozoic-Cenozoic denudation history of the Atlantic passive margin and its hinterland along the western coast of South Africa.

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High-elevation passive margins and their associated escarpments are the most prominent morphotectonic features resulting from continental break-up in Southern Africa. The aim of our study is to provide a strong, independent and location-specific quantification of their exhumation history. By using apatite fission-track (AFT) analysis in combination with cosmogenic ^{21}Ne and ^3He dating, we have been able to characterize the long term denudation history of various portions of Southern Africa's highlands.

First we present AFT data from outcrop samples along two traverses, roughly E-W, perpendicular to the trend of the present-day escarpment along the west coast of South Africa. All samples yield AFT ages ranging between 180 and 86 Ma, with the older ages characteristic for the continental interior above the escarpment. Modelling of the data reveals substantial denudation across the Atlantic margin of Southern Africa since the break-up of Gondwana, with a distinct period of accelerated denudation between 110 and 90 Ma. Exhumation along the coastal plains has exposed rocks that were at temperatures higher than 110°C at the time of break-up (~ 130 Ma). This suggests that more than 4 km of crust was removed. Farther inland, this amount of erosion decreases progressively to less than 2 km. Tectonic activity did not cease however immediately after break-up. Differential movement along normal faults is documented by the AFT age pattern to be as young as 100 Ma and therefore unlikely related to

tectonic activity associated with initial continental rifting. Instead, this late stage of uplift may be linked to regionally active mantle processes and coeval intrusion of a large number of kimberlites.

Our preliminary cosmogenic dating results indicate much lower rates of denudation from Late Cenozoic to recent times. Results provide reliable estimates for the active landscape evolution with vertical denudation rates on the interior plateau between 0.5 and 3 m/Ma and ~ 8 m/Ma along the margin of the escarpment.