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Post-rift uplift, paleorelief and sedimentary fluxes: the case example of the African margin of the South Atlantic

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Several attempts have been made to identify different paleosurfaces since the classical works of Lester King (1942, 1949) at the scale of Africa. Thermochronologists and river geomorphologists criticized this approach. This criticism mainly concerned the age of the surfaces, that were (1) poorly constraints and (2) a king of catechism on which all studies must refer.
Nevertheless, those planation surfaces exist and are key features of the present-day morphology of Africa. In details, real planation surfaces are (1) no more than two or three and (2) can be deformed and then merged together. Those surfaces are incised by large smooth valleys, called pediments or glacis (with some semantic differences between English and French-speaking geomorphologists). Those pediments formed a pre-network of rivers, later re-incised by the present-day incised narrow valleys.
Those different morphological structures can be dated using (1) their merge with sedimentary basins, (2) their relationship with the different types of dated weathering periods and (3) their relationships with volcanism.
They also can be used as a proxy of the deformation based on the differences of elevation of the planations surfaces or on the shape of the pediments.
From the Orange River to the Cameroon Volcanic Line, including the Congo Cuvette, two planations surfaces were identified (the Bauxitic or African surface, the intermediate surface), at least two generations of pediment valleys and the present-day incised valley network.
The African surface is of Late Paleocene to Middle Eocene age with a climax during this last period and two major periods of uplift can be identified and mapped (1) Late Eocene-Early Oligocene and (2) Lower Miocene. Most of the relief is fossil since that period, excepted in the Angola Mountains were deformations are active during Plio-Pleistocene times.
Those uplifts of smoother, most of the time weathered, relief than today, had important consequences on the petrology and the volume of eroded sediments. This can explain abnormal stratigraphic response along the African South Atlantic passive margins, such as thin clayey basin floor fans at time of uplift and erosion of weathering profiles.

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