Geophysical Research Abstracts
Vol. 13, EGU2011-5659, 2011
EGU General Assembly 2011

Cenozoic siliciclastic fluxes evolution around Africa

Cecile Robin (1), Francois Guillocheau (1), Samuel Jeanne (1), Florent Porcher (1), and Gerome Calves (2)
(1) Université Rennes 1, Geosciences, Rennes, France (cecile.robin@univ-rennes1.fr), (2) LMTG, Université de Toulouse III-CNRS, France

In the frame of the of the TOPOAFRICA project (french ANR), siliciclastic fluxes have been measured along the passive margins and abyssal plains of Africa (1) for discussing the relative importance of tectonic and climatic controls and (2) for constraining numerical models of relief growth (TOPOSED, Simoes et al., 2010) and then for quantifying the past topography of Africa.
This study is based on a seismic stratigraphy analysis of characteristic seismic lines all around Africa, from the upstream coastal plain to the deep abyssal plain, in order to get a complete sedimentary budget. The ages were provided by a set of wells (petroleum and DSDP/ODP) using synthetic sismograms to transfer this information on seismic lines. The biostratigraphy (mainly foraminifers and nannofosils) was reevaluated. The main limit of this approach is the effect of lateral sediment transport, and redistribution, by various types of currents parallel to the margins. This process is important along oblique transform margins (e.g. Zambezi and Limpopo margins).

• Most of the margins show an increase of the siliciclastic supply during the Cenozoic. Two exceptions are the Congo margins and the South African margins of the Indian Ocean.
• This increase can be explained by a change of the topography of Africa, due to the uplifts at 40-34 Ma, and from 20 to today, in a global frame of climate aridification. Another key factor, dependant of the deformation, and then uplift of Africa, is the removal of numerous subsiding endoreic systems, traps for sediments on the continent (e.g. Iullemeden basin in Niger; Chad and Sudan rifts. . .) during Neogene times.
• The Congo margin shows an increase of the sediment flux around 23 Ma, and then a decrease of the supply. The sharp increase probably records the growth and uplift of the Congo Cuvette. The decrease may be due (1) to the capture of the upstream catchment of the Congo by the Kivu, Edward and Albert Lakes rift system and (2) to the overall trend of aridification.
• The Indian Ocean margin of South Africa shows an increase around 20 Ma and then a sharp decrease. The geological and cosmogenic data suggest a last (low) uplift at base Burdigalian (around 20 Ma) and cosmogenic data indicate recent very low denudation rates, which is in good agreement with our data. The South African Plateau is a fossil feature since at least 20 Ma.

Keywords: Africa, Cenozoic, Siliciclastic sediment fluxes, Tectonics, Climate