U-Pb zircon ages and geochemical analyses of French Guiana recent coastal sediments under Amazon influence

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The French Guiana coastline is dominated by the NW migration of large mud banks originated in the continental shelf seaward of the Amazonian mouth. Their interaction with waves results in complex and markedly fluctuating shorelines with a few sandy beaches corresponding to "inter-bank phases" [1]. Sandy and muddy intertidal sediments considered respectively of local [2] and Amazonian origin [3] were studied with alternative provenance approaches.

LA ICP-MS U-Pb dating on detrital zircons has been performed on beach sand samples from the Cayenne promontory and the Maroni River mouth, further NW. The aim was to compare the obtained age distributions to that defined on the Amazon River sediments [4] and to U-Pb data from Guiana shield rocks [5], in order to test the hypothesis of a slight but significant contribution of Amazon Basin derived detrital minerals. Univocal zircon age distributions around 2.1-2.15 Ga confirm an almost exclusive detrital contribution of French Guiana sources to the sandy sediments. These results are supported by observations and automated single particle analyses performed with SEM-EDX.

As expected [3], recent muddy intertidal sediments from a mud bank located NW of Cayenne, in a remote zone, present geochemical patterns (trace-elements and REE) analogous to those of the Amazon River [6, 7]. However, a slight detrital contribution of the French Guiana hinterland to these sediments is suspected on the basis of their Nd isotopic composition.

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