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Variations of Detrital Inputs to the South China Sea from 0 to 150 Kyr: A Mirror of Climate Change

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Two ODP sediment cores from the South China Sea (Leg 184) sampled at about 2 kyr intervals from 0 to 150 kyr are investigated in order to decipher climate- and monsoon-driven signals recorded in the sediments.

Site 1143 is located to the northwest of the "Dangerous Ground", a region of islands and carbonate reefs on the southern continental slope of the South China Sea. Its location between carbonate reefs and the detrital deposit of the paleo-Sunda and the Mekong rivers makes the site sensitive to variations of both pelagic and terrigenous inputs. The sedimentation rate for the last 150 kyr at Site 1143 is about 6 cm/kyr. Present day water depth is 2772 m. Site 1144 is situated on the northern continental margin of the South China Sea, at 2037 water depth and close to Pearl River mouth, the second largest water discharge of China's rivers. The sedimentation rate at this site is remarkably high, on the order of 90 cm/kyr. Its position close to the mainland makes this site extremely sensitive to changes in riverine and aeolian input, and to shift between winter and summer monsoon.

Our group is using a wide range of geochemical (major and trace elements, Rock-Eval parameters, forms of P, etc.) and mineralogical parameters (bulk mineralogy, clay minerals) as proxies to understand the modes of past climate changes and the interplay of the various active feedback mechanisms. For example: changes in detrital inputs (i.e. changes in nutrient inputs) -> effects on the biogeochemical cycles of the oceans -> feedback on climate -> changes in detrital inputs. The present contribution focuses on geochemical parameters (such as Si, Ti, Al, Ba, Mg, K, Zr, but also Cd, Pb, V, Cr, Cu, Zn + REE, and others), which are useful to distinguish aeolian from riverine inputs, and to identify possible responses of autochthonous sedimentation to changes in the supply of detrital material.