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Lithogenic fluxes across a transect in the SW Indian Ocean since the last glacial inception

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On glacial-interglacial time scale the Southern Ocean plays a prominent role in modulating climate by storing and redistributing heat, fresh water, carbon and nutrients globally. Atmospheric CO_2 is taken up by algae and sequestered in the deep ocean through the biological carbon pump. On the other hand, CO_2 is released back to the atmosphere through upwelling and vertical mixing [1]. The relative contribution of these two mechanisms controls the efficiency through which carbon can be sequestered in the ocean interior.

The effect of iron fertilization on biological productivity has previously been documented in the Atlantic and Pacific sectors of the Southern Ocean [2, 3]. During glacial periods higher input of Fe-bearing dust increased phytoplankton growth and carbon sequestration, thus leading to the drawdown of atmospheric CO_2, accounting for about half of the glacial-interglacial CO_2 amplitude [4].

Here we present ^{230}Th-normalized lithogenic fluxes in a set of marine sediment cores spanning a meridional transect in the Indian sector of the Southern Ocean further away from the Patagonian dust plume and show that increased Fe flux impacted export production patterns, contributing to the sequestration of carbon away from the atmosphere.

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