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Sedimentary deposits on the southern South African continental margin: indications for the strength of oceanic currents

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The southern African continental margin represents a crucial gateway within the oceanic circulation system where Indian-Pacific Ocean and Atlantic Ocean water masses meet and mix. Here, surface Agulhas Current, Antarctic Intermediate Water AAIW and deep North Atlantic Deep Water NADW and Antarctic Bottomwater AABW are fully concentrated and flow into opposing directions. Hence, this is a unique location where the fluctuating strength on interocean circulation may be sensitively recorded by erosional-depositional processes on the subjacent seafloor over an approximately 4 km wide range of depths.

Seismic data collected on the southern South African continental margin show strong erosion on the shelf, slope, the Agulhas Passage and the Agulhas Plateau. In parts, the whole sedimentary column has been eroded and basement forms the seafloor. For the shelf, slope and the Agulhas Passage specific depth intervals can be identified, where the erosion is particularly strong. Those intervals span the water depths of 900-1700 m, 2000-2600 m, 2800-3000 m, and 4000-4500 m, and comprise the depth ranges of the Agulhas Current, AAIW, NADW, and AABW. Thus we can identify the paths of those water masses, and distinguish between them, via their erosive activity on the shelf, slope and in the Agulhas Passage.

This is not valid for the Agulhas Plateau. There, erosion occurs over the whole depth range of the seafloor. Thicker sediment bodies can be observed in between basement highs, and larger well stratified deposits can only be found on the southern plateau where basement topography is not that rough. On the northern Agulhas Plateau obviously both paths of the Agulhas Retroflection and the AAIW and hence deposi-

tion/erosion are primarily influenced by the basement topography.