



A-different Agulhas current circulation for the last glacial maximum: a model/data comparison

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The magnitude of heat and salt transfer between the Indian and Atlantic oceans through the 'Agulhas leakage' is considered important for balancing the global thermohaline circulation. Increase or reduction of this leakage is thought to strengthen or weaken of the Atlantic meridional overturning and associated North Atlantic Deep Water formation. Recent modelling simulations of the present and Last Glacial Maximum (LGM) climate shows a net difference in the interbasin exchange. Compared to the present climate, the LGM simulations show a net reduction of the Indo-Atlantic subtropical exchange, and this despite an increase in the strength of the overall wind-driven subtropical and subpolar general circulation. This hypothesis for a reduced LGM Agulhas leakage issued from numerical simulations is here compared with different proxies data collected in the Indian and Atlantic basins. Proxy records of past sea surface hydrology (alkenones, foraminifera transfer function and isotopes) were generated from marine sediment cores retrieved from the sub-Antarctic waters of the southern Indian and Atlantic Oceans at high resolution. The data show a strong recirculation of the Agulhas Current waters back into the Indian Ocean confirming a much reduced Agulhas Leakage during LGM. Wind conditions derived from terrestrial biomarker record add complementary information, which further support the paleoceanographic proxy data. The data and model results will be discussed in order to achieve a coherent description of the LGM general circulation of these two basins in relation with the Indo-Atlantic exchange and provide robust hypotheses on the processes responsible of the different behavior of the LGM ocean compared to the present situation.