



Enhanced Arabian Sea intermediate water flow during glacial North Atlantic cold phases

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During the last glacial period, polar ice cores indicate climate asynchrony between the poles at the millennial time-scale. Yet, surface ocean circulation in large parts of the globe varied in tune with Greenland temperature fluctuations suggesting that any anti-phase behavior to a substantial degree must lie in the deeper global ocean circulation which is poorly understood outside the Atlantic Ocean. Here we present data from the north-western Indian Ocean which indicate that the timing of maxima in northward extensions of glacial Antarctic Intermediate Water (GAAIW) coincides with dramatically reduced thermohaline overturn in the North Atlantic associated with the Heinrich-ice surge events (HE). The repeated expansion of the GAAIW during HE's, recorded far north of the equator in the Arabian Sea, suggests that southern hemisphere driven intermediate water mass variability forms an integral part of the inter-hemisphere asynchronous climate change behavior at the millennial time-scale.