SUPPLEMENTARY INFORMATION
Peeters et al. (2004). Vigorous exchange between Atlantic and Indian Ocean at the end of the last five glacial periods

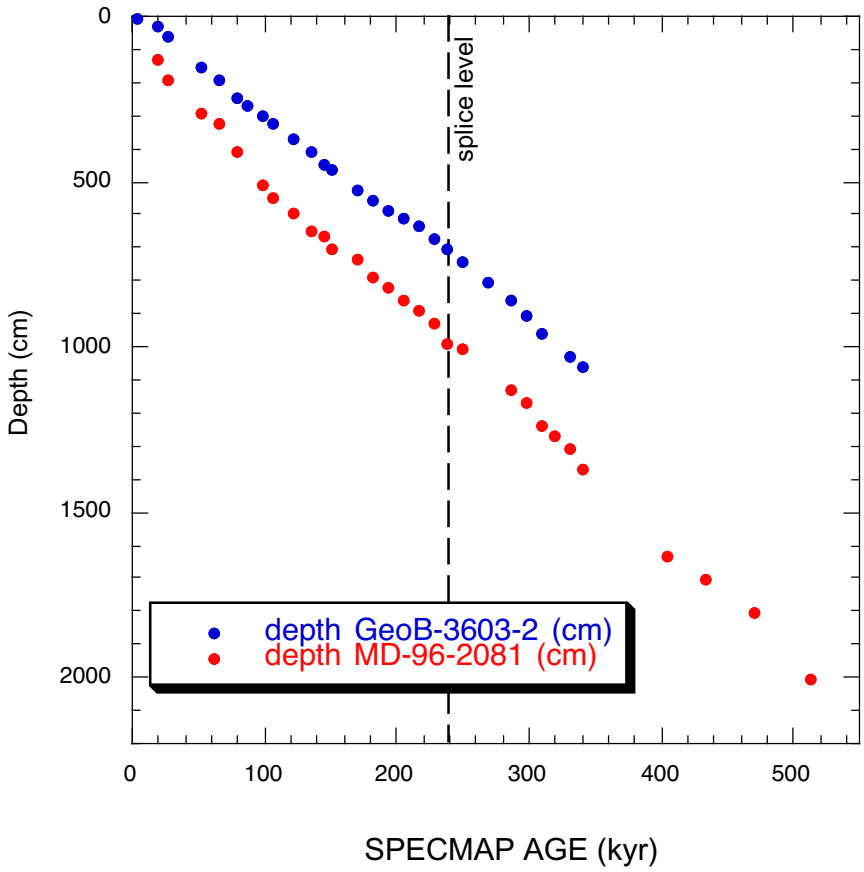

Figure S1 (Supplementary Figure 1.): Depth - age relationship for cores GeoB-3603-2 and IMAGES II MD96-2081. The dots indicate age control points for the age models of both cores. The joining point for the spliced recored was taken at the peak of MIS 7.5 (238 ka).The upper portion of the spliced record uses samples from core GeoB 3603-2 and the lower section is core MD96-2081. Samples in the overlapping section of core GeoB 3603-2 were removed to produce a single record which spans a continuous period of ~550 ky. Eighty-six of the samples from the bottom of core GeoB 3603-2 (708 cm to 1133 cmbsf) are not included in the Cape Basin record.

SUPPLEMENTARY INFORMATION
Peeters et al. (2004). Vigorous exchange between Atlantic and Indian Ocean at the end of the last five glacial periods

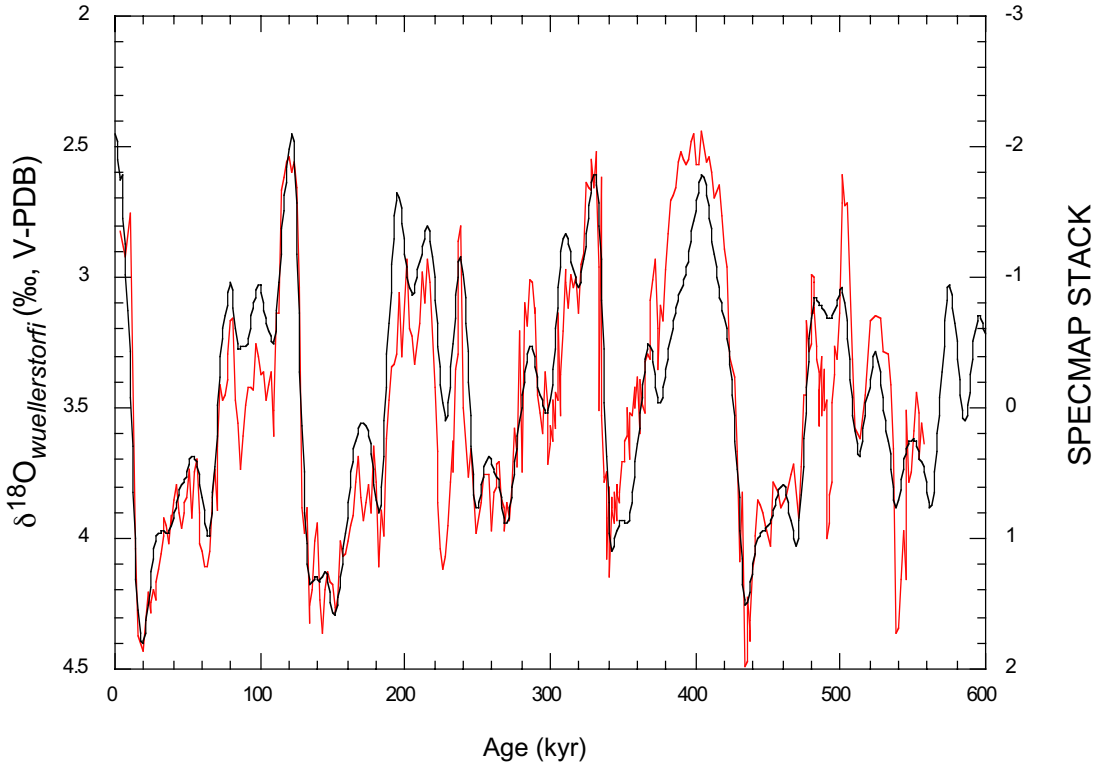

Figure S2 (Supplementary Figure 2.): The $\delta^{18}O$ of the benthic foraminifer *Cibicides wuellerstorfi* (red line) of the Cape Basin record after age tuning to the SPECMAP curve.

SUPPLEMENTARY INFORMATION
Peeters et al. (2004). Vigorous exchange between Indian and Atlantic Ocean at the end of the last five glacial periods

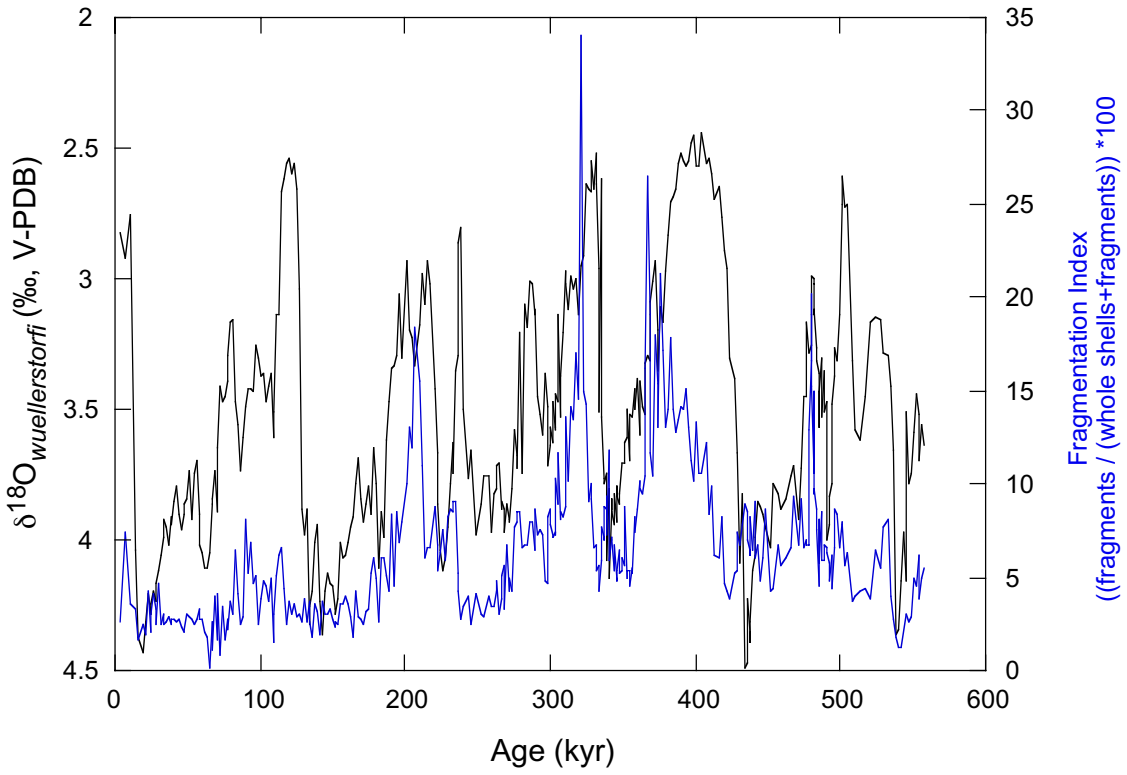

Figure S3 (Supplementary Figure 3.): The foraminifera fragmentation index of the Cape Basin record (blue line) and the $\delta^{18}O$ of the benthic foraminifer *Cibicides wuellerstorfi* shown for stratigraphic reference. The low fragmentation index reflects the excellent preservation of planktic foraminiferal carbonate in the Cape Basin record. Consequently the faunal proxy records are virtually unaffected by carbonate dissolution.

SUPPLEMENTARY INFORMATION
Peeters et al. (2004). Vigorous exchange between Indian and Atlantic Ocean at the end of the last five glacial periods

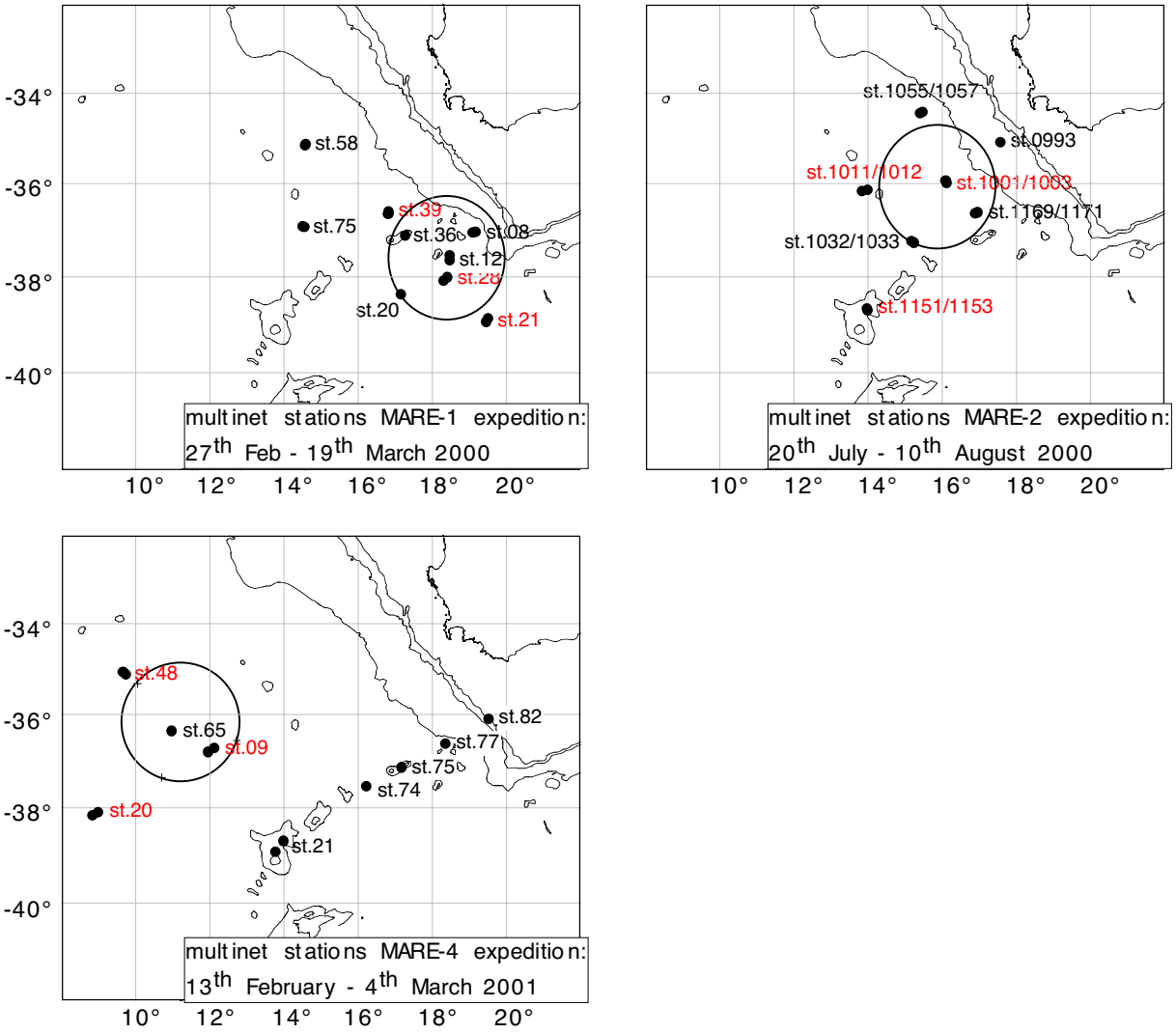

Figure S4 (Supplementary Figure 4.): Location of plankton tow stations (small dots) during three different cruises (MARE-1, MARE-2 and MARE-4) to the Cape Basin and their relative postion to Agulhas ring "Astrid", schematically indicated by the large circle. For the present study we used observations from nine depth stratified plankton tow stations. For each cruise we used three stations with each nine plankton tows (0 - 800 m). Stations used in this study are indicated in red. The stations were strategically chosen inside, near the boundary and outside the ring for each cruise.

SUPPLEMENTARY INFORMATION
Peeters et al. (2004). Vigorous exchange between Indian and Atlantic Ocean at the end of the last five glacial periods

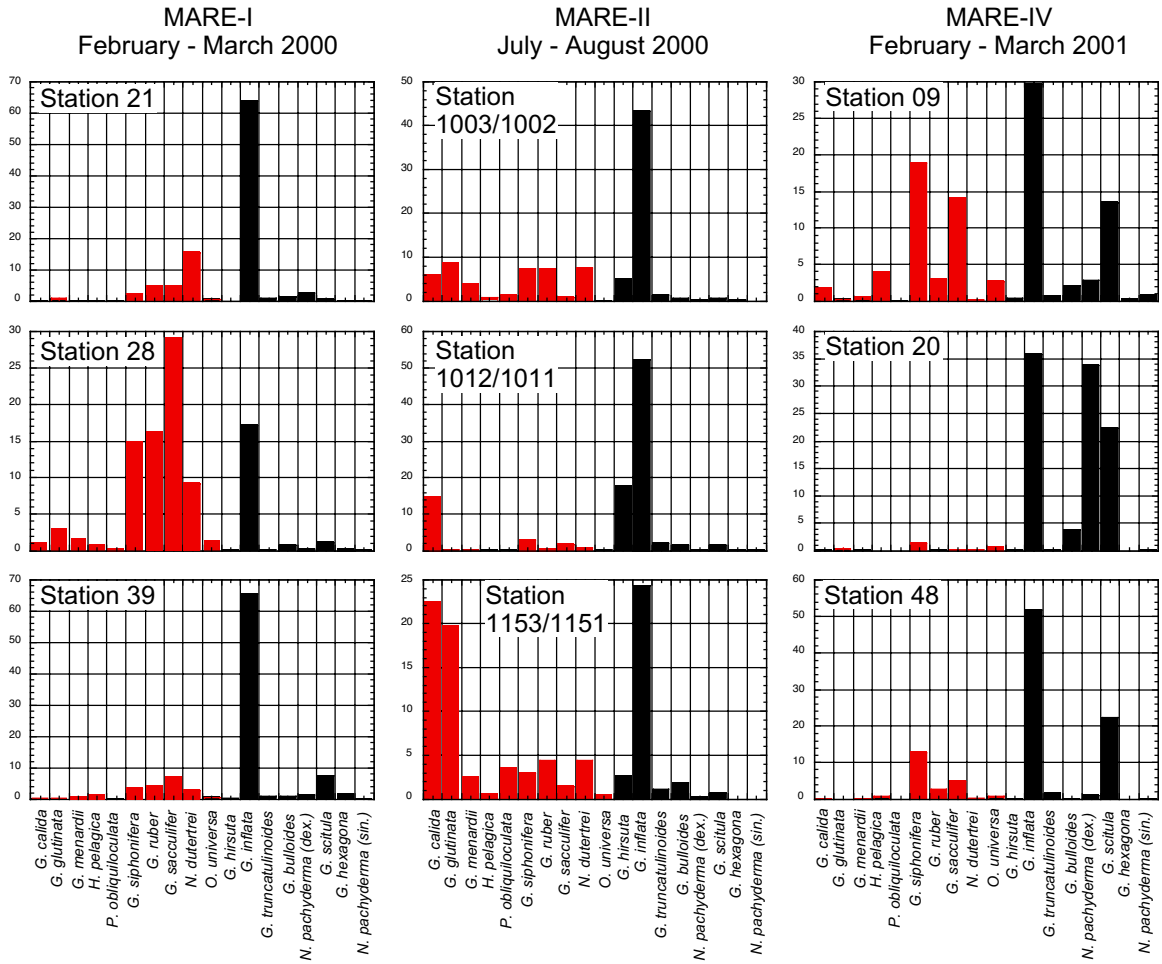

Figure S5 (Supplementary Figure 5.): The integrated standing stock per species for nine plankton tow stations. The nine panels show the depth integrated (0-800m) relative abundance of several species of planktic foraminifera (>150μm size fraction). For each station nine plankton tow samples were analysed. Species related to Agulhas water are indicated with a red colour bar. Station 28 of the MARE-I expedition indicates the centre of the Agulhas ring studied, while station 1153/1151 of the MARE-II expedetion is related to a second Agulhas ring south of the Astrid ring. Station 09 of the MARE-IV expedition was located in the centre of ring Astid one year after the first observations. Station 20 of the MARE-IV expedition was located distal from Agulhas water and retroflection as indicated by the absence of tropical species. Station locations are given in Figure S4.

SUPPLEMENTARY INFORMATION
Peeters et al. (2004). Vigorous exchange between Indian and Atlantic Ocean at the end of the last five glacial periods

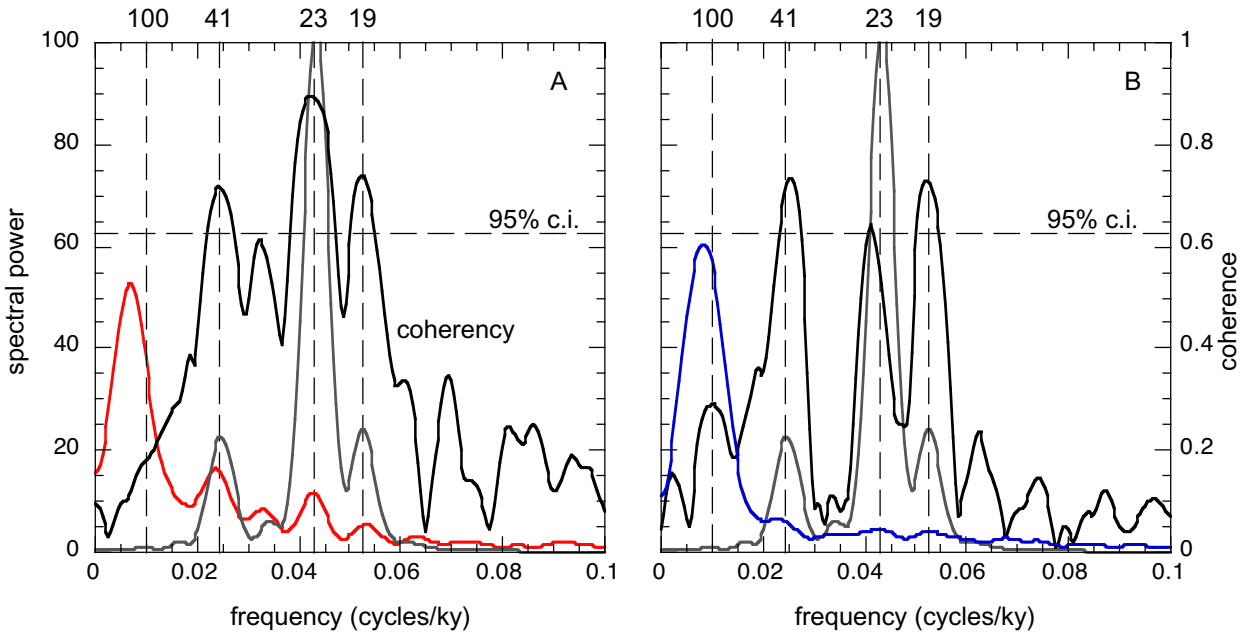

Figure S6 (Supplementary Figure 6.): Blackman-Tukey spectral cross correlation diagrams. Cross Spectral Analysis was performed between insolation June 60N and **(A)** the percentage of Agulhas leakage fauna, **(B)** the ratio of *G. truncatulinoides* over *G. truncatulinoides* + *N. pachyderma* (dex.) + *G. inflata*, reflecting the relative position of the STC. Coherency between the two records is indicated by the black line. The power spectrum for northern summer insolation is given in grey.The horizontal dashed line indicates the 95% conficence level for the coherency. Numbers above both panels refer to the orbital periods: Eccentricity (~100 kyr), Tilt (41 kyr) and the two Precesssional periods (23 and 19 kyr). The 100 kyr cycle is strongly dominant in the spectra of both proxy records (red for Agulhas leakage, blue for the STC ratio) reflecting the close relationship with Glacial/Interglacial cyclicity. The Agulhas leakage signal includes moderate tilt (41 ky) and precessional (23 ky and 19 ky) power coherent with northern summer insolation, implying both a 'low' and mid-high latitude forcing of the leakage. Maxima in Agulhas leakage appear to be related to maxima in northern summer insolation, suggesting a tele-connection to the monsoon system. The tilt component of Agulhas leakage is related to the position of the frontal zones as reflected in the 41 kyr component of the STC -proxy. Both systems, Agulhas leakage and meridional shifts of frontal zones, such as the STC, appear closely related to one another.