



Antarctic Ocean stratification changes during the last glacial cycle

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Precise correlations between a well dated Sub Antarctic core (RC11-120) and a core south of the Antarctic Polar Front (E49-7) allows the mapping of a high-resolution time scale into Antarctic sediments. In spite of little evidence for glacial-interglacial temperature change south of the Antarctic Polar Front there are major changes in the accumulation rates of deep- and shallow-living radiolarian species. Across the Pleistocene- Holocene boundary, for example, the accumulation rates of an assemblage of deep-living (>200m) radiolarians are reduced to a quarter of their Last Glacial Maximum (LGM) rate while an assemblage of shallow-living (<200m) radiolarians increases by 5 times and total radiolarian accumulation rates more than double. At the LGM deep-living species accumulation rates exceed those of shallow-living species and percentages of the deep-living species *C. davisiana* reach 43% of total radiolarians. Similar Holocene accumulation rates and *C. davisiana* percentages are found only in the Sea of Okhotsk which is characterized by cold highly stratified surface water and low mixed layer nutrients. Within the last glacial cycle (130K yrs.) multiple shallow and deep-living species accumulation rate maxima south of the Polar Front correlate with temperature maxima and minima respectively north of the Polar Front. Shallow-living species accumulation rate maxima have a pronounced “saw toothed” pattern and can be correlated with Vostok ice core temperature maxima. The changes of deep and shallow-living radiolarian species accumulation rates most likely reflect changes in surface water stratification and stability.