

# Reconstruction of Circumpolar Deep Water mass change in high latitudes Southern Ocean during the Last Interglacial based on radiolarian assemblage

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Understanding the dynamics of the Antarctic Ice Sheet (AIS) during past warm periods provides critical insight for predicting future sea level change associated with AIS mass loss. Previous studies show that AIS retreated significantly during warmer than the present climate periods. However, the causes and mechanisms leading to the significant ice mass loss in the past warm periods have remained uncertain. Recent observations indicate that basal melting of ice shelves due to the warm Circumpolar Deep Water (CDW) intrusion into the continental shelf is a key factor for destabilizing AIS, leading to ice mass loss. However, the lack of water mass proxies applicable to high latitude regions prevents to verify whether the enhanced CDW intrusion was a key factor for large-scale ice mass loss.

As radiolarian assemblages are closely related to the property of water mass, the radiolarian fossil assemblages have been used as a useful indicator of paleoceanography. Since radiolarians are common in high latitude oceans and their shells are preserved well in marine sediment, this method has the potential to reconstruct oceanographic changes in the high latitudes of the Southern Ocean. However, the applicability of this approach has not been tested at Southern high latitudes (south of 60°S).

In this study, we analyzed radiolarian assemblages in surface sediments collected from the high latitudes of the Southern Ocean to develop the paleoceanographic utility of the radiolarian microfossils in the Southern Ocean. Then, we applied the established approach to the marine sediment core to reconstruct the variability of CDW during the Last Interglacial (LIG).

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