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The Structure of the Eastern Weddell Sea Warm Inflow

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The Weddell Gyre has been widely described by various authors since the 1980's. Most of the literature, however, does not reflect the complicated structure of its inflow region east of 18° E, mostly due to the lack of data. Changes of water mass characteristics measured along the Greenwich Meridian were related to climate and/or long term alterations but can be explained also by variations in the mechanisms controlling the inflow of warm water at the eastern rim of the Weddell Gyre. Data from a Polarstern cruise in 2002/2003 along 0° E and 23° E were analysed using standard oceanographic parameter together with tracer information, e.g. CFC's.
Two main paths of the warm inflow were detected at 23° E which showed different composition of constituents and therefore indicate different sources in the ACC water body. Using the output of the BRIOS model, it can be shown that all of the Greenwich Meridian variations can be explained by the combination and superposition of these two inflows on their way to the west into the Weddell Sea interior.