



Formation of dense shelf water on the east Antarctic continental shelf off Adelie Land during 2008-2010

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As part of the ALBION project, two moorings have been deployed for 2 years 2008-2010 in the Adelie Depression, on the East Antarctic continental shelf off the George V Coast - Adelie Land (140°E-147°E). The moored instrumentation was in charge of documenting the formation and circulation of the dense shelf water which forms in winter in the Mertz Glacier Polynya. One mooring was located in Commonwealth Bay, a coastal bay where the dense shelf water is trapped by the topography in a deep separated from the main depression by a 400 m deep sill. The other mooring was deployed on the northeastern slope of the depression close to the Mertz Glacier. In Commonwealth Bay, the temperature and salinity measured by three microcats distributed in the vertical allowed identifying the different phases of the annual cycle of destratification and restratification of the water column. There is clear evidence of bottom reaching convection. The consequent accumulation of dense, saline product from June to September leads to a gradual increase of the salinity of the bottom water through the period. We present a comparative view of the annual cycles between 2008 and 2009. A strong contrast is identified between the two years with winter 2009 being more efficient in producing a high salinity shelf water. The influence of the atmospheric forcing and consequent brine rejection linked to sea ice formation in the polynya are investigated. The evolution of the hydrographical properties in Commonwealth Bay are compared with the evolution at the Mertz mooring where, by contrast, complete winter homogenisation of the water column seldom occurs while signatures of advection of surrounding water masses are observed.