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PHYSICAL OCEANOGRAPHY

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ABSTRACT Subject :

Tidal influence on downslope Flows of dense waters in the Ross Sea shelf break: an idealised model

Abstract 15/02/2023 13:51:10

High density Antarctic Bottom Water (AABW) holds a fundamental role in the global deep ocean ventilation processes. Those waters are partially composed by High Salinity Shelf Water (HSSW) that are generated by brine release during sea ice formation in the polynya area of Terra Nova Bay. From the production site HSSW fills up the Drygalsky basin as bottom waters, dense enough to flow northward and trigger downslope processes on the shelf break near the Cape Adare Region. The HSSW formation is mostly driven by ocean-atmosphere fluxes and sea ice formation processes, whereas its distribution pathways, near bottom dynamics are influenced by seabed morphology and the Coriolis force. Eventually, tides can modulate the outflow at the shelf break at the Drygalski trough mouth. To investigate the amount of water exported from the shelf area and its delivery time at different depths we implemented a series of idealised numerical simulation based on the Regional Ocean Modelling System (ROMS). Each simulation was based on a different combination of seabed slope and HSSW geometry and was implemented with and without tidal forcing.

