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Interocean Exchanges south of Africa of Antarctic Intermediate Water

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The polar-extrapolar communication of heat, freshwater and biogeochemical elements helps to close the hydrological cycle through the production, in the SO, of different water masses such as the Antarctic Intermediate Water and the Subantarctic Mode Water (AAIW and SAMW). While these water masses are important for the heat and fresh-water cycle and are strongly suspected to transport nutrients and carbon northward within the thermocline, the penetration of this water in each southern hemisphere basin is still under debate. Does it come from particular regions of the subantarctic belt or does it spreads northward homogeneously from the entire circumpolar region? This question is of particular importance for the Atlantic sector and its fresh-water budget. The ARGO data set proves to be suitable also to investigate this issue. Indeed, while data from the SO are usually concentrated along particular hydrographic sections, ARGO profiling floats spread large oceanic regions giving access to an unprecedented vertical and horizontal distribution. This is particular true for the GoodHope ARGO data. Deployed along the GoodHope transect they have spread eastward and northward giving a satisfactory sampling of the SO region south of Africa. These and other ARGO data from the region are used to evaluate the South Atlantic AAIW ventilation from the SO south of Africa. Their analyses suggest a direct inflow from the Indian Ocean and a weak contribution from the water locally ventilated. Indeed, the collected ARGO salinity profiles show a well defined zonality of the salinity minimum values. We will present estimates of the relative importance of the different variety of AAIW (south-west Atlantic, subantarctic and Indian) and their origins.