



An exchange window for the Antarctic Intermediate Water injection into the South Pacific

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Antarctic Intermediate Water (AAIW) occupies the intermediate horizon of most of the world oceans. Formed in the Southern Ocean, it is characterized by a relative salinity minimum. With the high density in situ NODC data set, we have reanalysed the formation and export characteristics of AAIW from the Southern Ocean into the South Pacific. This new data shows that (a) part of the AAIW is exported from the subpolar frontal region by the large-scale circulation through an exchange window of 10° width situated east of 90°W in the southeast corner of the Pacific basin and (b) local formation through ventilation most likely plays only a secondary role. A complementary set of numerical modelling experiments has been used to demonstrate that the dynamics of the exchange window is controlled by the basin-scale meridional pressure gradient. The exchange of AAIW between the Southern and Pacific Oceans must therefore be understood in the context of the large basin-scale dynamical balance rather than simply local effects.