



Seasonal circulation and volume transport in the Gerlache Strait

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We present the first observational-based assessment of the year-round circulation and volume transport in the Gerlache Strait, a key location for the water mass exchanges occurring along the west Antarctic Peninsula (wAP) between the relatively warm Bellingshausen Sea, flowing northeastward, and the colder Weddell Sea, flowing southwestward. These relatively warm/cold ocean water pathways have been documented to play a major role in the glacier retreat/stabilization of glaciers along the wAP (Cook et al., 2016). Bearing this in mind, we investigate a dataset of direct velocity measurements which were routinely collected along ship tracks from 379 cruises performed by R/V Nathaniel B. Palmer and R/V Laurence M. Gould between 1999 and 2018. A first set of analyses of an earlier version of this dataset was presented in Savidge & Amft (2009), who focused on the summer and winter views of the shelf circulation along the entire wAP. More recently, an updated version of such a dataset addressed the year-round circulation and volume transport of the Bransfield Current in the Bransfield Strait between 1999 and 2014 (Veny et al., 2022).

Preliminary results of this work focus on the ocean current variability displayed between 2008 and 2009, two years known in the literature as featuring remarkably opposite Weddell Sea influences along the central wAP (Wang et al., 2022); the former year with a weaker influence than the later one. Ongoing steps include the construction of a high-resolution (~5km) seasonal climatology of the ocean currents flowing through the Gerlache Strait, where the dataset of study ensures a multi-year spatial coverage of volume transport.

Key words: Gerlache Strait, Direct Velocity Measurements, Dynamic Structure, Volume Transport, Seasonal and Interannual Variability.

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