

Project Title:

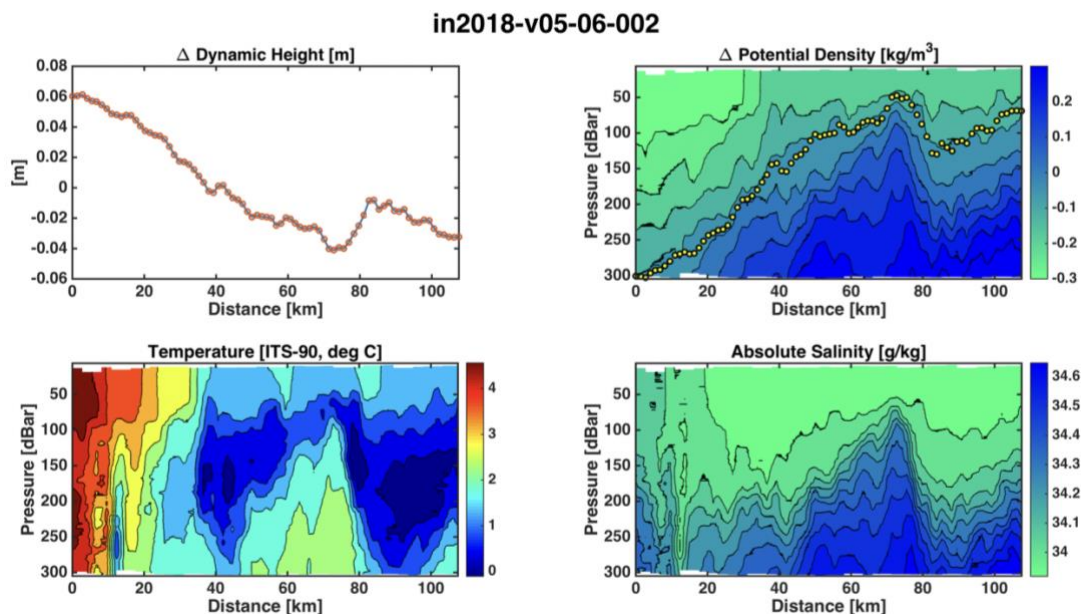
Smaller Scales of the Southern Ocean Dynamics.

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Project objectives:

- investigate the Antarctic Circumpolar Current dynamics in a circumpolar view, taking advantage of the higher resolution offered by SWOT
- describe the ACC dynamics in the region hereafter called ACC standing meander south of Tasmania (ACC-SMST) where a SWOT Fast Sampling Phase pass crosses the ACC in a high eddy heat flux area. This includes current-topography interaction and smaller scale dynamics testing using observations and modelling.
- analyse results from a 2018 cruise in the ACC-SMST and mooring data collected until 2020 as well as higher resolution altimetry from the Sentinel 3 and 6 satellites SAR mode.
- run a SWOT validation cruise in the same area in 2022
- benefit from the concomitant in-situ/satellite observations and smaller scale processes understanding to better monitor the heat fluxes in the ACC-MST and circumpolar over the whole science phase of the satellite.



Example of a 110km profile obtain using the Triaxus profiler acquired in the 2018 survey across the polar front. The profiling of Temperature (bottom left) and salinity (bottom right) at a 1km along track sampling allows to estimate the density profiles (top right) and associated dynamic height (top left). While the Triaxus profiling is limited to 300m depth, CTD profiles showed significant signatures of T,S small scale features down to ~ 700m. The dynamic topography signature of smaller scale features in the surface topography as expected to be seen by SWOT.

This investigation represents a unique effort to observe some of the most energetic ocean signals in the ACC where the measurements from SWOT may be noisier given the large waves regime while in situ measurements are always a challenge in the Southern Ocean.