



## **New Perspectives on Southern Ocean Frontal Variability**

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The frontal structure of the Southern Ocean is investigated using a the Wavelet/Higher Order Statistics Enhancement (WHOSE) frontal detection method, introduced in Chapman (2014). This methodology is applied to 21 years of daily gridded sea-surface height (SSH) data to obtain daily maps of the locations of the fronts. By forming frontal occurrence frequency maps and then approximating these occurrence-maps by a superposition of simple functions, the time-mean locations of the fronts, as well as a measure of their capacity to meander, are obtained and related to the frontal locations found by previous studies.

The spatial and temporal variability of the frontal structure is then considered. The number of fronts is found to be highly variable throughout the Southern Ocean, increasing ('splitting') downstream of large bathymetric features and decreasing ('merging') in regions where the fronts are tightly controlled by the underlying topography. In contrast, frontal meandering remains relatively constant. Contrary to many previous studies, little no southward migration of the fronts over the 1993-2014 time period is found, and there is only weak sensitivity to atmospheric forcing related to SAM or ENSO.

Finally, the implications of splitting and merging for the flux of tracers will be discussed.