A LAGRANGIAN VIEW OF THE TRANSFER OF SOUTHERN WATERS TO THE SOUTH ATLANTIC OCEAN

Anna Olivé Abelló, Josep L. Pelegrí and Ignasi Vallès-Casanova

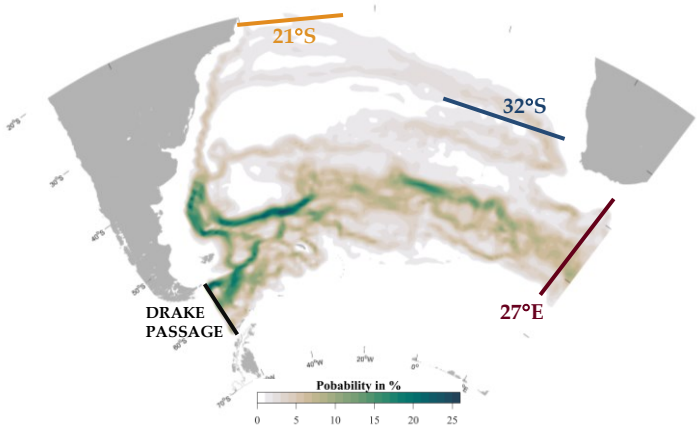
Department of Physical and Technological Oceanography, Institut de Ciències del Mar, CSIC, Barcelona, SPAIN. **aolive@icm.csic.es, pelegri@icm.csic.es, valles@icm.csic.es**

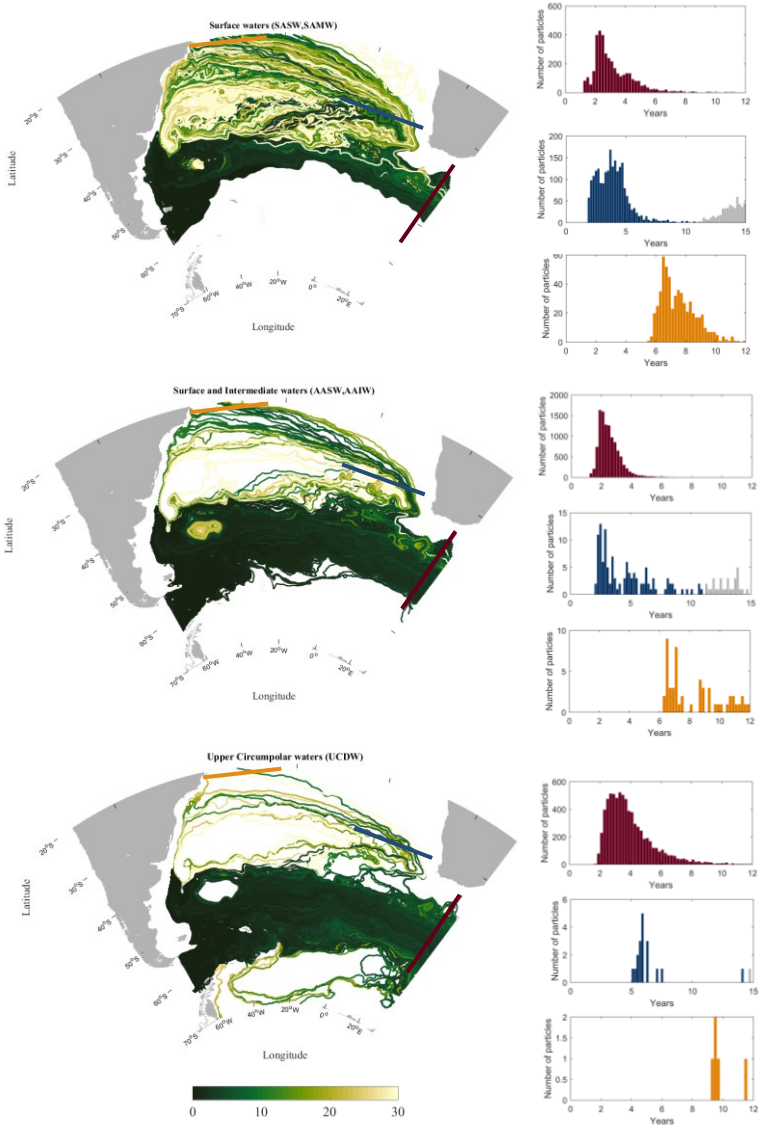
OBJECTIVE

Explore the **pathways, transit times** and **seasonality** of the **Antarctic waters** that are **incorporated to the South Atlantic**, with special attention to their **recirculation** in the subtropical gyre and escape northward through the North Brazil Current as part of the returning limb of the Atlantic Meridional Overturning Circulation.

METHODS

We use the daily values of climatological GLORYS12v1 velocity fields (u,v,w) for 2002-2018 and obtain trajectories with **OceanParcels** software. We include small diffusive (K_h=50 m^2/s) motions.





PRELIMINARY RESULTS

Subantarctic Surface and Mode Waters (SASW/SAMW): **75%** of the transport follows the Antarctic Circumpolar Current (ACC) into **27°E** while the remaining **25%** is incorporated to the subtropical gyre through **32°S**. Among the latter, 48% veer northward into the **21°S** section.
Antarctic Surface and Intermediate Waters (AASW/AAIW): 98% of the transport follows the ACC and **2%** join the subtropical gyre.
Upper Circumpolar Deep Water (UCDW): 99% of the transport follows the ACC and only **1%** drift cross the **32°S** section, and only 50% of the latter reach through the **21°S** section.

The median times for the Drake Passage water particles to get to the **27°E**, **32°S** and **21°S** sections are: 2.3, 3.6 and 6.5 year for the **SASW/SAMW**; 1.9, 2.5 and 6.5 year for the **AASW/AAIW**; and 3.3, 5.9 and 9.5 year for the **UCDW**, respectively.

At **27°E**, there is an increase of **AASW/AAIW** and decrease of **SASW/SAMW** in autumn. At **32ºS** and **21°S**, the **SASW/SAMW** transport experiences a decrease by the end of the year while the **AASW/AAIW** transport contribution remains stable**.** In all transects, the contribution of **UCDW** remains stable along the year.