

Is the Antarctic sea ice variability linked to the Antarctic Circumpolar Current (ACC) variability?

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The Antarctic Circumpolar Current (ACC) is a geostrophic flow that surrounds the Antarctic continent and its associate sea ice sheet. It moves from west to east, in a clockwise pattern of circulation. It acts as an important climate and environmental barrier by isolating the cold waters around Antarctic from the relative warmer waters in the southern Atlantic, Pacific and Indian Oceans. Due to large-scale meanders, the ACC velocity front (region of maximum geostrophic velocity) is not spatially steady, what allows the ACC to approach and move away from Antarctic from time to time. In this work, we aim at understanding whether the variability of the Antarctic sea ice extent is somehow linked to the variability of the ACC velocity front, both in terms of location and intensity. To do so, we first explore geostrophic velocity and sea ice concentration data from satellites along few different longitudinal transects around the Antarctic continent, in order to track both the sea ice extent (the isoline of 15% of sea ice concentration) and the ACC velocity front. In the second step, the variability (seasonal cycle, interannual variability and long-term trend) of these two climate players are compared. Based on these results, we will be able to draw preliminary conclusions on whether or not the sea ice extent variability is somehow coupled to the ACC velocity front variability.

Poster preference