



Variability of the Antarctic Circumpolar Current deduced from time-variable GRACE gravity fields

Inga Bergmann, Henryk Dobsław, and Maik Thomas

GFZ Potsdam, Geodesy and Remote Sensing, Potsdam, Germany (ingab@gfz-potsdam.de)

The Antarctic Circumpolar Current, being the strongest ocean current on Earth, connects all major ocean basins and contributes substantially to the global re-distribution of water masses, with direct consequences on the world's climate. Observational coverage from in-situ measurements is sparse due to the harsh environmental conditions, and satellite altimetry does not capture the full extent of the current due to seasonal sea-ice coverage. Ocean bottom pressure variations as sensed with the satellite gravity mission GRACE therefore provide a promising way to broaden our observational basis.

Besides monthly mean gravity fields that provide ocean bottom pressure variations averaged over 30 days, several alternative GRACE products with higher temporal resolution have been developed during the most recent years. These include monthly mean gravity fields from GFZ, CSR and JPL, 10-day solutions from GRGS Toulouse, as well as constrained daily solutions from the University of Bonn which have been obtained by means of a Kalman filtering approach. In this presentation, bottom pressure derived from these GRACE releases will be contrasted against both in-situ observations and output from a numerical ocean model, highlighting the additional information contained in these GRACE solutions with respect to the standard monthly fields.