Geophysical Research Abstracts
Vol. 15, EGU2013-7635, 2013
EGU General Assembly 2013

Measuring Agulhas Current strength and leakage from satellite altimetry

Dewi Le Bars, Wilhelmus P. M. De Ruijter, and Henk A. Dijkstra
Utrecht University, IMAU, Utrecht, Netherlands (dewi.lebars@gmail.com)

The Agulhas leakage is a flux of relatively warm and salty water from the Indian Ocean to the South Atlantic Ocean. It occurs south of the African continent where the Agulhas Current retroflects and sheds large anticyclonic eddies that quickly break up and mix with the surrounding water. This is one of the most energetic regions of the world ocean and the Agulhas leakage is therefore very difficult to quantify.
In recent years two independent studies (Biastoch et al. 2009, Rouault et al. 2009) using different ocean models pointed out the possibility that the strength of the Agulhas leakage could have increased over the last decades. Unfortunately several discrepancies exist between these two studies on the magnitude and the causes of this increase showing the limitations of numerical modelling in this area.
In this work we use a combination of along-track and mapped satellite geostrophic velocities to compute the strength of the Agulhas Current and to follow Lagrangian particles released in its core. The results confirm a positive trend of the volume of Agulhas leakage over the last two decades. This allows us to investigate the dependence of the leakage to upstream conditions like the Agulhas Current transport, the pattern and strength of the westerly winds and to test previous theories on the relations between these factors.

Biastoch, A., Böning, C. W., Schwarzkopf, F. U. and Lutjeharms, J. R. E.: Increase in Agulhas leakage due to poleward shift of Southern Hemisphere westerlies, Nature, 462(7272), 495–498, doi:10.1038/nature08519, 2009.

Rouault, M., Penven, P. and Pohl, B.: Warming in the Agulhas Current system since the 1980's, Geophys. Res. Lett, 36(L12602), doi:10.1029/2009GL037987, 2009.