

Observed eddy dissipation in the Agulhas Current

Abstract

Eddies from the Mozambique Channel and south of Madagascar cause disturbances in the Agulhas Current that are thought to affect the Agulhas Retroflexion, and the formation of warm and saline Agulhas Rings which leak into the South Atlantic Ocean. However, little is known regarding the evolution of source region eddies as they approach the northern reaches of the Agulhas Current core. Using satellite and surface drifter observations, it is shown that source region eddies dissipate as they approach the Agulhas Current. It is demonstrated that the interaction of both cyclonic and anti-cyclonic eddies with the current can significantly affect the velocity and position of the Agulhas Current core. The velocity anomalies caused by eddies are clearly visible as they propagate down the Agulhas Current, affecting current speeds for an average period of 10 weeks for anti-cyclonic eddies and 15 weeks for cyclonic eddies. Finally, eddy dissipation processes in the Agulhas Current are not well represented in state-of-the-art regional models, highlighting the need for further investigation into these processes.