

A journey of discovery into the windy origins of Agulhas transport variability
Katherine Hutchinson, Juliet Hermes, Isabelle Ansorge and Lisa Beal

Hypothetically when there is an alteration in wind stress curl in the Indian Ocean, there is an adjustment of the circulation within the basin, ultimately resulting in a modification in the volume transport of the western boundary current. This research aims to investigate the relationship between fluctuations in the Agulhas Current (AC) transport and changes in winds and wind stress curl (WSC) across the Indian Ocean basin on annual to inter-annual time scales. The long term variability of the AC has so far been poorly understood due to the lack of high resolution observations and reliable model simulations. The Agulhas Current Time-series (ACT) has recently become available, however, providing an appropriate source *in situ* data from which a 20 year proxy for AC transport has been developed. A time series of WSC driven vertically integrated meridional transport for the Indian Ocean is calculated for the the latitude of the ACT array. Using the two decades of WSC and AC transport, we have embarked on a journey of exploration into the controls of seasonality and inter-annual variability of the Agulhas. We have enquired as to why the AC southward transport highest in austral summer, yet the winds are strongest in winter, and how these two annual cycles are related. The role of topographical barriers hindering the coherency of signal propagation across the basin is investigated, various lead-lag assessments are undertaken, and various filtering techniques are assessed. What we have discovered so far will be presented, along with an exciting idea for the road ahead.