



Long range transport of a quasi isolated chlorophyll patch by an agulhas ring

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Using satellite retrievals of sea surface chlorophyll and geostrophic currents we study the evolution of a distinct chlorophyll patch transported by an Agulhas ring along a $\sim 1,500$ km track. Throughout an ~ 11 months period of the total 2 years eddy lifetime, the shape of the chlorophyll patch is consistently delimited by the horizontal transport barriers associated with the eddy. Analysis of Lagrangian time series of sea surface variables in and around the eddy suggests that the evolution of the chlorophyll patch is driven by two processes (i) slow lateral mixing with ambient waters mediated by horizontal stirring in filaments, and (ii) rapid events of wind induced vertical mixing. These results support the idea that mesoscale eddies shape biological production through the combination of horizontal and vertical dynamical processes, and emphasize the important role of horizontal eddy transport in sustaining biological production over the otherwise nutrient-depleted subtropical gyres.