

CASE STUDIES OF SATELLITE TRMM MICROWAVE IMAGER SIGNATURES OF SEA SURFACE COOLING ASSOCIATED WITH TROPICAL CYCLONES OVER THE SOUTH-WEST INDIAN OCEAN

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Abstract Case studies of four selected intense tropical cyclones sweeping over the South-West Indian Ocean towards the African mainland are described. This is done in relation to their interaction with the surface waters as they move from east of Madagascar into the Mozambique Channel. The TRMM Microwave Imager 3-day SST data illustrates oceanic response to these cyclones. Cooling of surface waters in the wake of the cyclones was manifested by temperature decreases of between 2 and 7 °C indicating mixing by upwelling and entrainment in combination, down to 150 m. Assuming pre-cyclone linear temperature profiles below the shallow (30 m) warm, mixed layer we calculated changes in heat and potential energy and estimated the contribution to surface cooling by entrainment and upwelling, respectively. Temperature profiles from Argo floats and from the Agulhas Current Sources Experiment are employed, to underpin the results.