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SEASONAL VARIABILITY OF AIR-SEA HEAT FLUXES DERIVED FROM SATELLITE AND NUMERICAL WEATHER FORECAST IN THE INDIAN SECTOR OF THE SOUTHERN OCEAN

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This work addresses the seasonal variability of air-sea heat fluxes over the Indian sector of the Southern Ocean in an attempt to understand the climate variability using satellite winds and numerical weather forecasts (NWF) during 1999 - 2004. Bulk aerodynamic formulae have been used to estimate latent and sensible fluxes by coupling Scatterometer-based QuikScat winds over ocean, Reynolds SST and surface meteorology from NWF. Composite and time series analysis has been used to infer the surface heat budget. The monthly climatology indicate that the neat heat flux is dominated by turbulent heat flux by about 90% in the Agulhas Retroflection Region (ARR) and further east to about 80 degrees east during austral winter. Latent heat flux also overwhelms other terms of the heat budget equation in the Antarctica Circumpolar Current region. During austral summer short wave flux dominates the entire expanse of the study area with a maximum of 150 W/m^2 south of 45 degree east in the west. The temporal variability of net heat flux averaged on 2 x 2 degree box centered on the ARR reveals an increasing trend in the heat loss promoted by meridional wind stress. Closer to Antarctica (53 - 55 degree south) the heat is gained by the ocean on annual basis. Different processes that modulate these fluxes are explored.