M.S.28. PADMINI, R.– Studies on Energy Exchange Between Sea and Atmosphere from the Indian Ocean – 1983 – Dr. A.V.S. Murthy.

An attempt is made to assess the large space-scale and time history of the energy flux fields, over the Indian Ocean north of 40°S latitude and its adjacent seas. Energy fluxes through the surface have been calculated using bulk aerodynamic equations with exchange coefficients which vary with windspeed and radiation equations based on Budyko.

The inter-annual variations of sea surface temperature are studied and the annual variations of the sea surface temperature, air temperature and sea level pressure are studied using harmonic analysis.

Unlike North Atlantic and Pacific, the North Indian Ocean shows highest values of evaporation during summer.

Northern Indian Ocean shows unique behaviour in its distribution of marine meteorological parameters and subsequent interaction with the atmosphere.

Large amounts of radiation energy are available in the western Arabian Sea for the genesis of the Indian monsoon and its movement. The same region shows the maximum advection of cold water, due to intense upwelling during summer monsoon months.

During transitions, Bay of Bengal on account of warmer waters exhibit more evaporation, since the wind speed values are much low, where as during summer monsoon season, when the zonal anomalies are at the maximum, with very low values of cold upwelled waters in the western Arabian Sea, on account of high speed winds of monsoonal current, western Arabian Sea exhibits more evaporation.

The quantitative assessment of zonal difference in the hast budget shows that the host budget is basic to the climatic assymmetry between western and eastern portions of the low-latitude oceans.

The time-series of heat balance and its components show that the annual course of the heat balance is disrupted during individual years and months chiefly as a result of a sharp increase or decrease of evaporation. The intensity of heat emissions and its periodic variations throughout the North Indian Ocean and its relation to the gigantic event of monsoon is clearly seen.

The influence of general cicumlation over the sea surface temperature or vice versa, where the cause and effect is difficult to be differentiated is obvious from the results.

A significant positive correlation, between simultaneous monthly water temperature during south-west monsoon from the western Arabian Sea and the intensity of monsoon, is observed.

The harmonic analysis of sea surface temperature, air temperature and sea level pressure indicates latitude dependence, with a tendency to show higher oscillations over the western side of Arabian Sea and Bay of Bengal.

The far-reaching sea surface temperature anomalies in the western Arabian Sea is quite astounding. It is clear that cold water anomalies along with the proximity of vast landmass creates the unique situation during northern summer.

The differentiation of cause and effect between SST and monsoon activity is not clear. Here most of the time the development of intense upwelling and cold water advection is arbitrarily chosen as starting point, which leads to a chain of events. However, it can be said that the monitoring of the largescale air-sea interactions as a consequence of sea surface temperature anomalies will have great impact on future attempts in climatic forecasting.