M.S.52. MURALEEDHARAN, P.M.–Studies on the equatorial undercurrent in the Indian Ocean–1985–Dr. G.S. Sharma

The main objective of the thesis is to carry out a detailed investigation of the seasonal, latitudinal and longitudinal variation of the Equatorial Undercurrent in the Indian Ocean and also the Equatorial jet, through mapping the vertical distribution of the oceanographic properties across the equator along various longitudes for all the months of an year, between 5° N and 5° S. Zonal flux is computed by adopting the method of Montgomery and Stroup (1962), in order to have a quantitative variation of the Equatorial Undercurrent and the Equatorial Jet.

Transequatorial sections are chosen, as far as possible, in such a way that at least one section is included in each month in the three within the longitudinal limits of west 65° E, 65-85° E and east of 85° E respectively. On the whole, 31 vertical sections are prepared, out of which 11 sections are selected for the computation of zonal flux. The method of representation of the flux is novel that it displays the flux on a temperature-salinity diagram. Characteristic classes are chosen that are difined by thermosteric anomaly and salinity.

Unlike in the other major oceans, the Equatorial Undercurrent appears only seasonally in the Indian Ocean because of the reversal of the atmospheric circulation over the North Indian Ocean. It is present all along the width of the Indian Ocean with the normal characteristic features of the undercurrent, during February to April. But the commencement of the Undercurrent takes place in January in the western region, sometimess even in December. Further, it is noticed that in the beginning it is located slightly north of the equator due to upwind shift of the northerlies prevailing in the western region. The Undercurrent is also found to be initially develped in the western region and extends to the east and shifts south to the equator with time. Before the termination of the Undercurrent it is found to shift southward due to the wind shift. Also it is found that the Equatorial undercurrent in the Indian Ocean is absent from late June to early December.

Flux distribution during February, March and May in the western Indian Ocean presents slightly higher values in March. In general, the transport increases from the western to the central Indian during the latter period of northeast monsoon while it remains almost unchanged in the eastern region. The strong surface easterly flux present during the two transition periods denotes the Equatorial Jet and is symmetrical about the equator within 3° N and 3° S.

A limitation of the present study is that the data used for various sections do

not pertain to the same year. With regards to the zonal flux estimation, it is not very correct to compute the same at and near the equator as it leads to uncertainty, the coriolis parameter which comes in the denominator being zero. To avoid this problem for computation of the zonal flux, the curent was computed at no two stations across the equator.