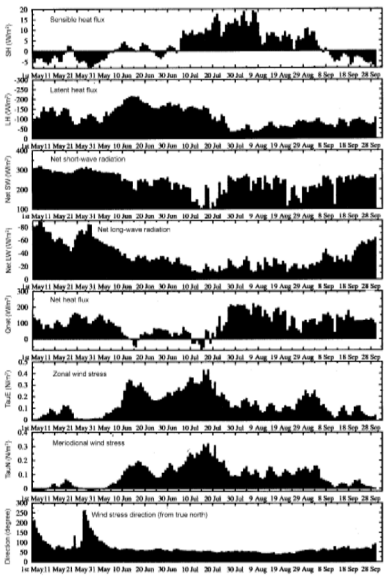
In this issue

Rainfall along west coast of India

Indian summer monsoon has a large inter-annual as well as intra-seasonal variability over temporal and spatial scales. Onset dates, monsoon activity within a monsoon season and quantity of the monsoon rainfall are also found to vary from year to year. One important synoptic feature associated with the onset of monsoon is the existence of a strong cross equatorial Low Level Jet (LLJ) with its core around 850 hPa over the Indian Ocean and south Asia. This LLJ generally supports the large-scale moisture and momentum transport from ocean to atmosphere and the consequent rainfall over the Indian mainland. Mishra *et al.* (**page 475**) have used buoy data at a stationary position in the Arabian Sea



(15.5°N, 61.5°E) to understand the air–sea interface processes before, during and after the onset of the monsoon 1995. They conclude that LLJ has played an important role in determining the rainfall variability over the west coast of India.

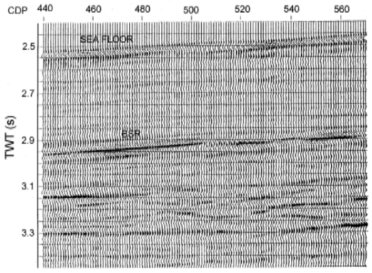
Tropical cyclone position determination

A significant portion of the errors in the predicted position of tropical cyclones (TC) can be attributed to uncertainties in the cyclone's initial location itself. Methods that use visible-infrared images for the retrieval of cyclone positions over the Indian Ocean generally encounter the problem of 'cirrus-shield' in which the upper level clouds obscure most of the cyclone structure at lower levels. In contrast, clouds are mostly transparent in microwave images and these images reveal the 'physically-direct' picture of TC structure from the patterns of different hydrometeors like rainfall, liquid water droplets and ice/snow particles. For high frequency microwave channels (e.g. 85 GHz) of a satellite, scattering of radiation by hydrometeors (mostly by ice/

snow particles aloft the deep convection) is a dominant process, and hence these channels unambiguously display the patterns of intense convection in the vicinity of the center of a tropical cyclone. These patterns that can lead to the precise determination of a TC center are almost always present in 85 GHz images, particularly when the cyclone has matured in intensity. Moreover the high spatial resolution of high frequency microwave channels ensures a better accuracy in TC position determination. Patadia *et al.* (**page 504**) have analysed images from 85 GHz channel of TRMM Microwave Imager (TMI) to determine the center location of a number of tropical cyclones over the Indian Ocean and these positions show significant differences with TC positions documented by India Meteorological Department.

Seismic reflection data

Knowledge of shear waves is very important in quantifying the resource estimates of hydrocarbon reserve and in deriving meaningful geological information. The ratio of longitudinal to shear waves gives bounds for arriving at a petro-physical model, which may ultimately provide an accurate estimate for the reserve. Gas hydrates are emerging as the most probable viable alternative and their quantum



can only be established provided shear wave data are observed at the ocean bottom. In this regard observations of Ocean Bottom Seismometers (OBS) is gaining importance in the oil industry. The study of OBS observation in relevance to gas hydrate exploration is critical, as it not only gives an estimate of gas hydrate reserve but also postulates a model for the presence of free-gas below the gas hydrates. In the Indian context such observations are yet to be made in terms of data acquisition, processing and its interpretation. It is quite relevant to simulate such gas hydrate models and their response before an effort is launched for conducting field observation of OBS. Uma Shankar *et al.* (**page 515**) report such an attempt.