mesoscale advective event, seen in the temperatures from below the mixed layer, with the change in the surface forcing makes it difficult to determine the true cause of this mixed layer shoaling. Through August and into September the surface temperatures rise slowly. The diurnal variability, which has been suppressed during the strong winds of June and July, is apparent during low wind stress periods in August, and becomes strong again at the end of the record as Fall Intermonsoon conditions return.

The mixed layer depth increases to a maximum of just less than 80 m through the middle of July. Even a mixed layer depth derived from the very tight criterion of a 0.02°C difference from the near-surface temperature, near the resolution of the temperature sensors, shows that diurnal restratification is strongly reduced. In the last week of June the wind stress decreased for several days, and though the standard (0.1°C difference from near-surface temperature) mixed layer depth continued to deepen, the more tightly defined mixed layer (0.02°C) shows some daily restratification to about 20 m depth during this period. In the last week of July, when the wind stress drops to a lower level and the net oceanic heating increases markedly, the mixed layer shoals, and the diurnal cycling in the near-surface stratification becomes more pronounced. The wind stresses during this period are still stronger than those found during the NE Monsoon, though the surface buoyancy forcing is of the opposite sign. In the last week of August and first week of September, an increase in the wind stress and a reduction in the buoyancy forcing appear to force a deepening in the mixed layer, accompanied by a reduction in the diurnal cycling in near-surface stratification. The second week of September is when the wind stress finally decreases significantly, and the mixed layer quickly shoals.

7.2. Salinity

The salinity in the upper water column during the SW Monsoon is reasonably uniform, but drops from about 36.5 to 36.0 during the course of the SW Monsoon. This is inconsistent with the surface forcing, which by itself would cause a rise in the surface salinity. There is considerable variability on a 3–7-day period, and an interleaving with salinities from the upper thermocline. The complexity in the time-series of the salinity is consistent with snapshots obtained in SeaSoar surveys (Lee et al., 2000), which showed interleaved features with horizontal scales between 20 and 70 km. The general reduction of the salinity both within and below the mixed layer suggests that advection plays an important role in controlling salinity during the SW Monsoon.

7.3. Velocity and shear

The largest signal in the velocity record during the SW Monsoon begins in late July and continues through the end of August, first as large (about 60 cm s^{-1}) eastward velocities, slowly turning southward before diminishing at the end of record. The contour plot of the velocity components in the upper 120 m (Fig. 23) shows that this large velocity signal penetrates well below the mixed layer, and thus is not primarily locally wind-driven. The first half of the SW Monsoon's velocity record shows velocities that are trapped in the mixed layer, and have variability at the inertial period. This period coincides with the strongest winds of the record.

An EOF decomposition of the velocity and variance-scaled wind stress (Fig. 24) does not clearly separate a wind-driven component, but when compared to the decomposition of the NE Monsoon it shows that there is more of a locally wind-driven component in the higher modes. The first mode, associated with 70.7% of the variability, has a low but significant correlation with the wind, and is surface-intensified, although it appears to contain a combination of locally wind-driven and remotely driven velocity structure. The next two modes have higher correlations with the wind stress, but a much lower proportion of the variance associated with them. An EOF decomposition of the velocities for just mid-June through mid-July extracts a dominant structure that is closely associated with the wind. A progressive vector diagram of the currents for the SW Monsoon (Fig. 25a) shows a transport to the right of the main axis of the wind, as might be expected due to Ekman transport. However, the transport