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Systematic and Random error correction of ship based marine meteorological parameters observed across Tropical Indian ocean

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In this study, ship based observations obtained from Indian Meteorological Department (IMD) and Naval Operations Data Processing and Analysis Centre (NODPAC) observed across Tropical Indian ocean (TIO) are combined with International Comprehensive Ocean-Atmosphere Dataset (ICOADS R3.0) and several climatology are generated for TIO. The ship observations from the Voluntary Observing Ships (VOS) have been found to contain both random and systematic errors. An attempt is made to apply a systematic correction upon wind speed (WS) and random error correction upon sea level pressure (SLP), dry bulb temperature (DBT), sea surface temperature (SST), dew point temperature (DPT). The systematic error correction upon WS is actually a correction applied to the old World Meteorological Organization (WMO) 1100 scale, i.e. the Beaufort estimated wind speeds are corrected as the old WMO 1100 scale was found to have errors. The new July scale derived exclusively for TIO rightly reduces the over estimation of high WS and increases the under estimation of lower WS as given by the old WMO 1100 scale. The systematic bias between anemometer measured wind speeds and Beaufort estimated wind speeds reduced from 0.52 m/s (obtained after the correction done by previous scale) to 0.08 m/s with the new scale. The random errors are calculated based on a technique called semi-variogram analysis technique. The fluxes derived from the observation error corrected variables are analyzed and the net heat flux across TIO was observed to reduce by 14 W/m².