Diurnal Cycle Induced Amplification of Sea Surface Temperature Intraseasonal Oscillations Over the Bay of Bengal in Summer Monsoon Season

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In spite of strong mean summer monsoon winds, the magnitudes of diurnal and Intraseasonal oscillations of SSTs in the Bay of Bengal (BoB) are as strong as the respective magnitudes in the western Pacific. Using continuous observations during peak summer monsoon of 1998 at BoB buoy (DS4) located at (89°E, 19°N), we show that the strong near-surface diurnal variation in the Bay during warming phases of ISO leads to almost double the magnitude of diurnal SST over BoB as compared to that during the cooling phases. Simulation experiments with and without the diurnal cycle of surface fluxes indicate that more than one third of the observed SST ISO amplitude could arise from rectification of diurnal cycle through the influence of late night and early day-time upper ocean mixing processes during warming phases. The rapid shoaling of upper ocean mixed layer occurs during afternoon while it deepens slowly during late night and early day time which tend to retain the warm SSTs at the end of the night-time cooling. Insight derived from these experiments on influence of the diurnal cycle on ISO of SST underlines the need for proper simulation of diurnal cycle of SST in climate models.