The mixed layer variations in the marginal sea off the western coast of Sumatra associated with the MJO passage during the Pre-YMC and YMC

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The mixed layer variations in the marginal sea off the western coast of Sumatra before and after the passage of the Madden Julian Oscillation (MJO) observed during the R/V Mirai cruises (Pre-YMC [Years of the Maritime Continent]: MR15-04 and YMC: MR17-08) are investigated. During the MR15-04 cruise, the halocline above 20 m depth was very strong before the MJO arrival, and the mixed layer depth (MLD) was very shallow (< 10 m). During the MR15-04 cruise, it was difficult to increase the MLD by the MJO wind bursts because of a very strong surface salinity stratification (> 0.1 psu/m) before the MJO. In contrast, during the MR17-08 cruise, the layer of 20-100 m was relatively mixed well in comparison with that in MR15-04 because of the stronger MJO wind bursts and the MLD was easily fluctuated due to the diurnal cycle of the surface heating. The difference of the MLD variations between MR15-04 and MR17-08 led the difference of the sea surface temperature tendency and could change the air-sea interaction processes under the MJO.

Keywords: ocean mixed layer, Madden Julian Oscillation