

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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Abstract:

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.

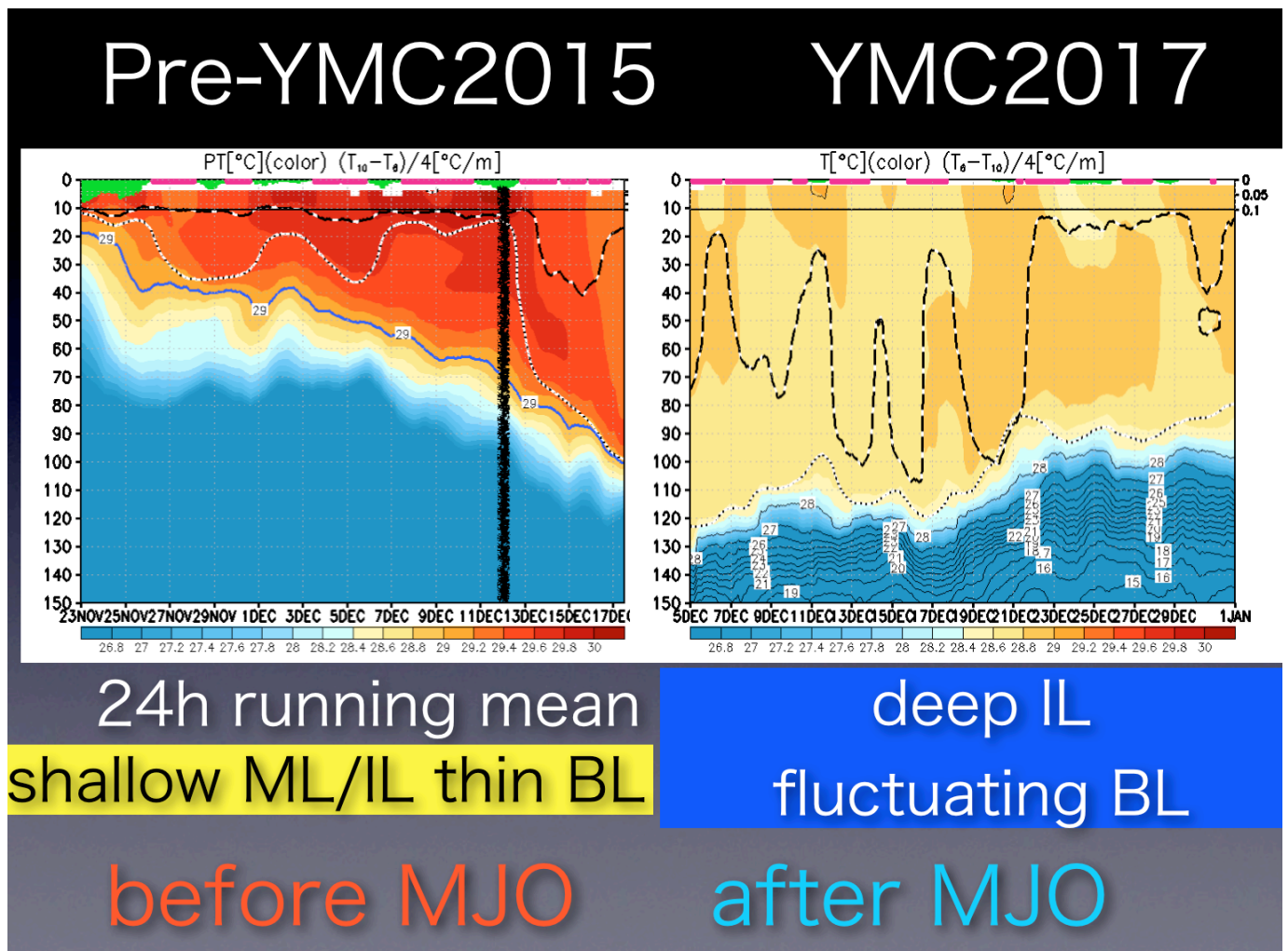
Pre-YMC と YMC 期間中の MJO 通過に伴うスマトラ西方沖縁辺海の混合層変動

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要旨：

海洋地球研究船「みらい」による観測航海(Pre-YMC [Years of the Maritime Continent]: MR15-04 and YMC: MR17-08)によって観測された MJO (Madden Julian Oscillation)の通過前後におけるスマトラ西方沖の縁辺海における混合層変動を調べた。MR15-04 航海では、MJO 通過前における表層 20m

までの塩分成層が非常に強く、混合層深度は 10m 以下で極めて浅かった。その浅い混合層深度は、0.1 psu/m を超える表層の極めて強い塩分成層のため MJO に伴う強風によってさえも深まりにくかった。それに対して、MR17-08 航海では、より強い MJO の強風によって、MR15-04 航海に比べると 20-100 m の層が比較的良好に混合しており、混合層深度は地表面加熱の日変化によって激しく変動していた。MR15-04 と MR17-08 における混合層変動の違いは、海面水温変動傾向の違いをもたらし、MJO 通過時における大気海洋相互作用過程を変化させると考えられる。



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