

# Response of tropical atmosphere to diabatic heating and its relation with ENSO

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By resolving the linear adiabatic equations on equator  $\beta$  plane, the response of tropical atmosphere to diabatic heating caused by oceanic heating anomaly was analyzed, as well as its relations with ENSO. Results show that the direct effect of diabatic heating of ocean to atmosphere, its causing Kelvin wave and Rossby short wave are the reasons of the variation of longitudinal wind speed and disturbed geopotency of atmospheric zero class. During El Nino period, the positive atmospheric geopotential anomaly firstly occurred in the West Pacific, but with the continuity of the positive anomaly of the oceanic heating, a atmospheric anomaly causing air-sea coupled system to normal condition or to La Nina developed in the West Pacific. The identification of the above situation is the occurring and eastward of Kelvin wave triggered by diabatic and the large value of positive geopotential anomaly moved eastward and became weaker in the West Pacific, so the trade wind strengthened. During the period of the strongest La Nina, oceanic heating existed negative anomaly (weaker than the average), the situation was reverse.

Key words: atmospheric circulation, tropical atmosphere, diabatic heating, ENSO, Kelvin wave

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