

## 5-7-day wave in the equatorial atmosphere during CPEA campaign period and its possible association with large-scale cloud features

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Tropical convective clouds are often organized into large-scale convective systems. Latent heat release within these organized convective systems is the principal heating mechanism, which excites large-scale equatorial waves with periods nearly a week or more.

Radiosonde observations of winds and temperature over a few sites in Southeast Asia and Northern Australia during CPEA campaign period show the presence of 5-7 day wave in the upper troposphere and lower stratosphere (UTLS) during first half of CPEA campaign period. The wave is predominantly observed in zonal wind and Temperature in the altitude region 17-23 km and is damped above 23 km. Temperature and zonal wind perturbations are in quadrature with the former lead the latter. The phase profiles over the different sites suggest that the wave could be an eastward propagating wave. These characteristics reveal the possibility of the observed wave to be a Kelvin wave. Vertical wavelength is estimated to be around 5 km, which is consistent with that of equatorial waves excited due to convective heating. The predominant planetary zonal wavenumber of the wave is around 2-3. The downward phase propagation of the wave could be observed at heights above 13 km and this suggests that the tropospheric convective heating could be the possible source for the wave.

The wave of similar periodicity is observed in Mesosphere and Lower Thermosphere (MLT) region with more amplitude during second half of CPEA campaign period, which is an active phase of Madden-Julian Oscillation (MJO), the largest component of convection organized large-scale systems. During this active phase, three super cloud clusters (SCCs), which are associated with atmospheric disturbances having a Kelvin wave type structure passed eastward over the observation sites with the time interval of nearly 5 days. This suggests that the wave may be associated with large-scale cloud systems. With these preliminary results, our present study is investigating whether there is a link among convective processes in the troposphere and wave activity of similar periods observed in the lower stratosphere and MLT region. The results obtained will be discussed during the meeting.