



The cloud radiative heating over the Indian subcontinent

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Monsoonal circulation is one of dominant modes of seasonal variability that affects the livelihood of millions over the Indian subcontinent. It is therefore important to understand various processes influencing monsoon, especially those dealing with atmospheric interactions.

Convective cloud systems cover much of the subcontinent during the summer season and these systems occur in a wide range of spatio-temporal scales ranging from individual convective towers with the lifetime of some hours to mesoscale systems covering hundreds of kilometers and sustaining for days. The importance of diabatic heating of the atmosphere produced by these systems during monsoon is pointed out in a number of studies, including the role of cloud radiative heating.

However, very little is known regarding the vertical structure of cloud radiative heating and its pre- to post-monsoon transitioning. In this context, using state-of-the-art satellite based estimates of cloud radiative heating from Cloud-Sat (five year period) and TRMM (nine year period), we try to address the following scientific questions in the present study.

- 1) How does the vertical structure of cloud radiative heating change from pre-monsoon to post-monsoon season?
- 2) How do intraseasonal oscillations in monsoonal rainfall influence variability in the heat budget?
- 3) How do the zonal and meridional vertical heating gradients change during monsoon months?