

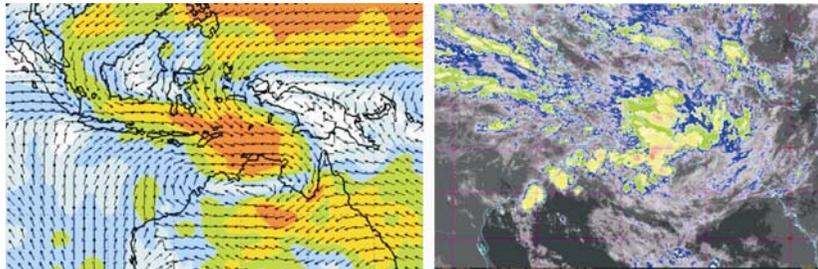
Diurnal variations of clouds in a monsoon environment

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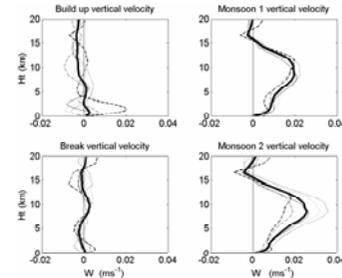
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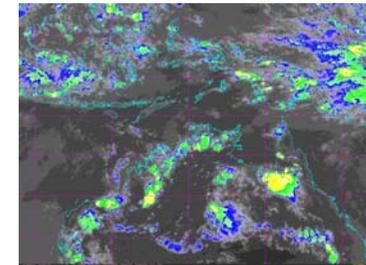
Motivation: Models have major problems replicating the observed diurnal variability of clouds and convection:
Case study of diurnal variability in two different large scale environments with significant convection
Monsoon: large scale support for convection, break : suppressed on the large scale, but potential instability is similar



Monsoon: large scale ascent and widespread convection with a weak diurnal cycle

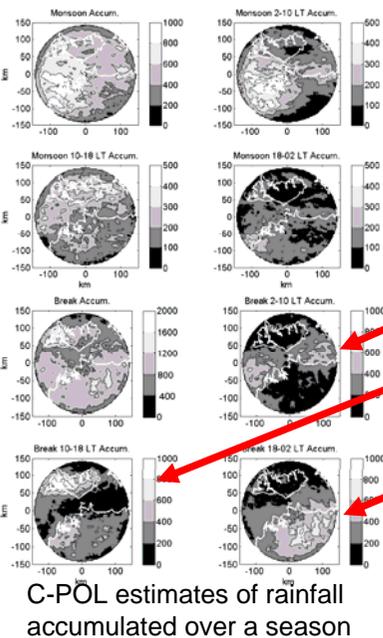


Large scale vertical motion breezes



Break – convection on sea and a dry line

Rain and convection



Monsoon
Weak diurnal variation

Break:

Land breeze convection

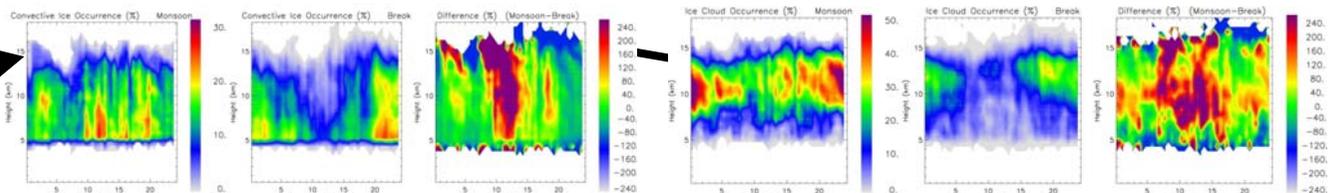
Afternoon convection on sea breeze

Evening storms propagate in from convergence across the other side of the top end

Ocean
Land

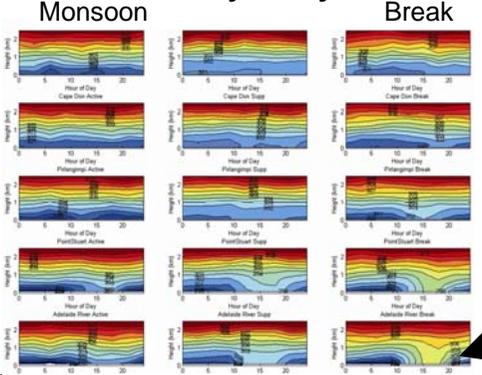
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Cloud occurrence



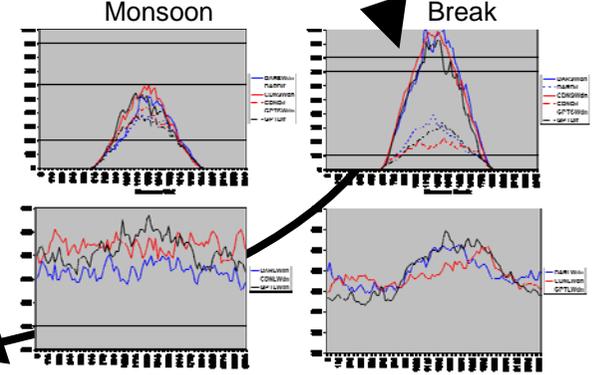
Follows rain, but do see diurnal variation in coverage resulting in the following radiative impacts.

Boundary Layer



Diurnal composites of potential temperature

Sfc Radiation



Corresponding diurnal variations of the boundary layer. In the break there are large spatial variations of structure associated with convection and cloud cover