High-resolution CAM 5 runs with and without a deep convection parameterization (w and w/o DCP)
Minimum Surface Pressure

CAM Track 5
control w/o DCP

NHC

Day of Aug 2005
Propagating MCC’s?
Hourly precip CAM-5(b) \textit{without deep convection parameterization}
Hourly precip CAM-5(b) without deep convection parameterization
Seasonal Means (JAS 2005)

Runs initialized June 1, 2005

(Comparisons with 2.0x2.5)
CAM-5(b) and CAM-5(b) w/o deep convection param  JAS 2005

Spurious S Pacific ITCZ gets worse at high resolution and worse still without deep conv. param.
Monthly mean tropical difference profiles:

\textit{Difference=NoDCP-CTL}

- Black = 0.23x0.31
- Red = 2.0x2.5

\begin{align*}
\varphi T (20S-20N) \\
\varphi q (20S-20N)
\end{align*}
Some statistics
Vertical motion coincident with heavy precipitation (>100 mm/d)
TRMM 3B42 intensity PDF, 5-days, 30S-30N vs Control (ZM)  RAS  No-DeepCon

Note: No-deepCon still has UW shallow convection
Log-frequency
Instantaneous low-level horizontal divergence Aug 1-7 12S to 12N (6-hrly)

-1e-3 +1e-3
0.0
-1e-3 +1e-3

CAM-5 CTL
w/o DCP
Joint pdfs of low-level divergence and precipitation
Instantaneous 4x dly for 7 days 12S to 12N

<table>
<thead>
<tr>
<th>Standard</th>
<th>No-DCP</th>
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<tr>
<td><img src="image1" alt="Joint pdfs Standard" /></td>
<td><img src="image2" alt="Joint pdfs No-DCP" /></td>
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**Difference**

| ![Difference](image3) |
Summary

Some encouraging aspects in tropical cyclone simulations – both forecast and seasonal

*ZMNR deep scheme allows TCs to deepen, but seems to interfere with midwest MCCs.*

Precipitation means look similar in high resolution w and w/o DCP

*Some biases are worse at high res.*

Other climate aspects, e.g., mean T q profiles similar in 0.25 runs w and w/o DCP.

*: Convection-free AMIPs?*

Precipitation intensity statistics are different in runs w and w/o DCP

*Problems in DCP run: weak extremes, excessive moderate rain*

Low level divergence has large extremes in run w/o DCP.
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To provide facility support to the wider community; and,
To apply the results to benefit society.

NCAR is sponsored by the National Science Foundation

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