1/4 DEGREE CAM5 PRECIPITATION CHARACTERISTICS IN THE EASTERN TROPICAL PACIFIC IN SHORT FORECASTS

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Standard CAM 5.1

0.25 degree Finite Volume Dynamical Core
56.25 second time step
vertical remapping every 7.5 minutes

1 degree physics tuning parameters
15 minute physics time step

5-day forecasts initialized from
ECMWF YOTC analyses
00Z January 3 to January 24, 2009

Compare to 3-hourly 0.25 degree TRMM (3B42)
CAM5.1 climate courtesy of Mike Wehner
FORECAST ENSEMBLE  24-HR PRECIPITATION

DAY 1

CAM 5.1

DAY 3

DAY 5

TRMM
3-HR PRECIPITATION, IC = 03 January

CAM5.1

TRMM

DAY 1

DAY 3

DAY 5
24-HR PRECIPITATION, IC = 09 January

CAM5.1

DAY 1

DAY 3

DAY 5

TRMM
3-HR PRECIPITATION, IC = 09 January

CAM5.1

DAY 1

DAY 3

DAY 5

TRMM
INDIVIDUAL FORECASTS

2 to 8 DEGREES

IC = 3 JAN  IC = 9 JAN  IC = 15 JAN  IC = 21 JAN

CAM5.1

TRMM
INDIVIDUAL FORECASTS
2 to 8 DEGREES

CAM5.1 PRECT
IC = 6 JAN

CAM5.1 PRECL
IC = 6 JAN

CAM5.1 PRECC
IC = 6 JAN

TRMM PRECT
IC = 6 JAN
FORECAST ENSEMBLE
2 to 8 DEGREES

CAM5.1
PRECT

CAM5.1
PRECL

CAM5.1
PRECC

TRMM
PRECT
0.25 degree CAM 5.1 precipitation compared to TRMM

Individual forecasts

XY maps
- Small amounts over too large an area
- Cells too strong and too many

Hovmoeller diagrams
- Too coherent in time
- Not enough variability on diurnal time scale
- Cells are too strong, too long lived
- Too coherent in time
- Less eastward propagation
0.25 degree CAM 5.1 precipitation compared to TRMM

Ensemble of forecasts

XY maps
ICTZ too strong
but not as strong as climate

Hovmoeller Diagrams
Overall pattern in PRECC similar to TRMM
Diurnal variation
Lack of westward propagation from South America

Cellular activity dominates PRECL
Sample size too small to average it out
PRECL dominates PRECT
INDIVIDUAL FORECAST, IC = 6 JAN
2 to 8 DEGREES

PRECT
5 MIN T-SCALE

PRECL
5 MIN T-SCALE

PRECC
5 MIN T-SCALE

PRECT
TRMM

CAM5.1

TRMM
INDIVIDUAL FORECAST, IC = 15 JAN
2 to 8 DEGREES

PRECT
5 MIN T-SCALE

PRECL
5 MIN T-SCALE

PRECC
5 MIN T-SCALE

PRECT
TRMM

CAM5.1

CAM5.1

CAM5.1

TRMM
FORECAST ENSEMBLE
2 to 8 DEGREES

PRECT
5 MIN T-SCALE

PRECL
5 MIN T-SCALE

PRECC
5 MIN T-SCALE

PRECT
TRMM

CAM5.1

TRMM
IC = Jan 3, DAY 3 FORECAST

3-HR PRECIPITATION

24-HR PRECIPITATION

5 MIN T-SCL

TRMM

CAM5.1