Evaluation of CFMIP2 models using COSP: the role of clouds in the radiation budget over the Southern Ocean

A. Bodas-Salcedo
CMIP3 coupled models

(Trenberth and Fasullo, J. Clim., 2010)
Data and methodology

• AMIP experiment. Daily-means of ISCCP simulator outputs, radiative fluxes and MSLP. Additional COSP diagnostics for some models.

• Daily ISCCP-FD radiative fluxes and ERA40 MSLP.

• Region 40S – 70S.


• Preliminary results.
CRE bias around cyclone centres
Cluster RFO: ISCCP
Summary

• Methodology that combines clustering and compositing, linking cloud radiative properties and synoptic conditions.

• Preliminary results from analysis of AMIP experiment:
  • Spatial structure in CRE errors in cyclones, related with errors in cloud regimes.
  • Too frequent frontal cloud seems to explain most of the error in LW CRE.
  • Some models show some similarities: too much shallow cumulus and too little stratocumulus.
  • In some cases, the results suggest compensation of errors between frequency of occurrence and radiative properties.
Thin Cirrus

(a) ISCCP/ERA40

(b) CanAM4

(c) CNRM-CM5

(d) HadGEM2-A

(e) IPSL-CM5A-LR

(f) MIROC5

(g) MPI-ESM-LR

(h) MRI-CGCM3

© Crown copyright   Met Office
CloudSat reflectivities

(a) OBS

(b) CNRM-CM5

(c) CanAM4

(d) HadGEM2-A
CALIOP Scattering ratio

(a) OBS

(b) CNRM-CM5

(c) CanAM4

(d) HadGEM2-A