



BESM
Brazilian Earth System Model

Testes, Ajustes e Validação do código de Radiação RRTMG: Rapid Radiative Transfer Model

Diego Pereira Enoré

Grupo: Atmosfera

Abril/2015



Ministério da
Ciência, Tecnologia
e Inovação





BESM
Brazilian Earth System Model

Índice



Ministério da
Ciência, Tecnologia
e Inovação



RRTMG - SW

- Coeficientes de absorção são obtidos diretamente do modelo line-by-line LBLRTM
- Fluxos e taxas de aquecimento são obtidos para 14 bandas espectrais.
- Fontes de extinção considerados são: H₂O, CO₂, O₃, CH₄, O₂, N₂, aerossóis e espalhamento Rayleigh.
- Uso do algoritmo Two-Stream para realizar cálculos de espalhamento.
- Utiliza o método de Monte Carlo para representar variabilidade de nuvens em escala de subgrade.

RRTMG - LW

- Coeficientes de absorção são obtidos diretamente do modelo line-by-line LBLRTM
- Fluxos e taxas de aquecimento são obtidos para 16 bandas espectrais.
- Fontes de extinção considerados são: H₂O, CO₂, O₃, N₂O, CH₄, O₂, N₂ e diversos halocarbonos (CFC-11, CFC-12, CFC-22, e CCL₄).
- Utiliza o método de Monte Carlo para representar variabilidade de nuvens em escala de subgrade.

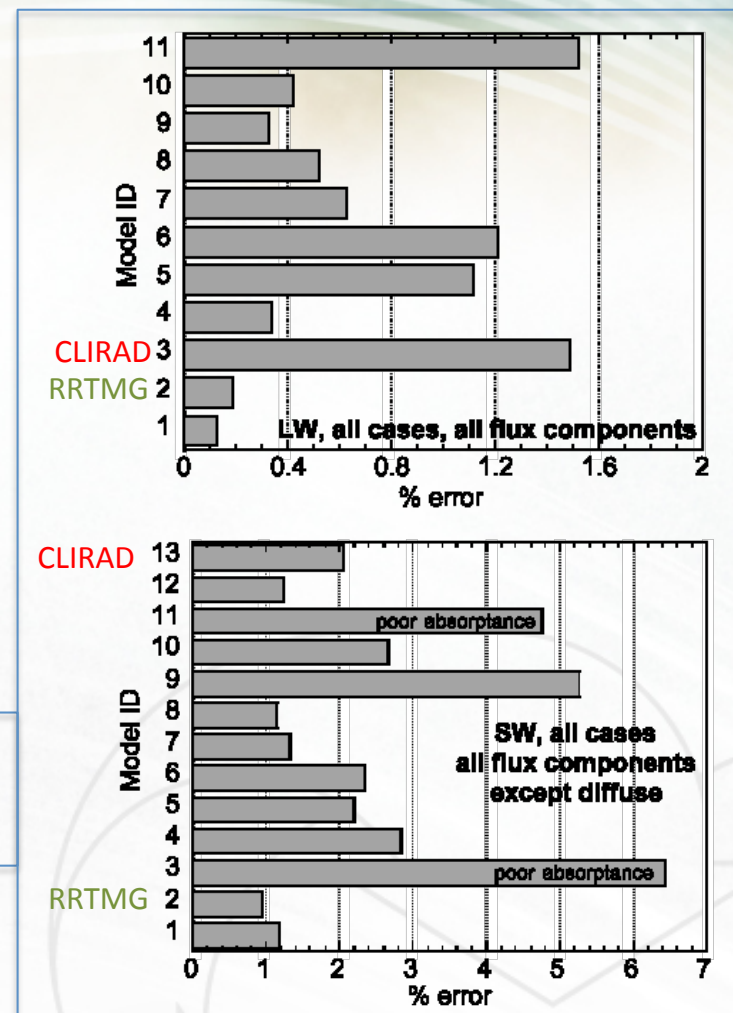
Por que o RRTMG?

Presente nos principais modelos dinâmicos:

- WRF-ARW
- NCAR CAM5 e CESM1
- NASA GEOS-5
- NCEP GFS, CFS, RUC
- ECMWF IFA e ERA40
- ECHAM 5

Apresenta os menores erros (CIRC)
(Oreopoulos et al., JGR, 2012)

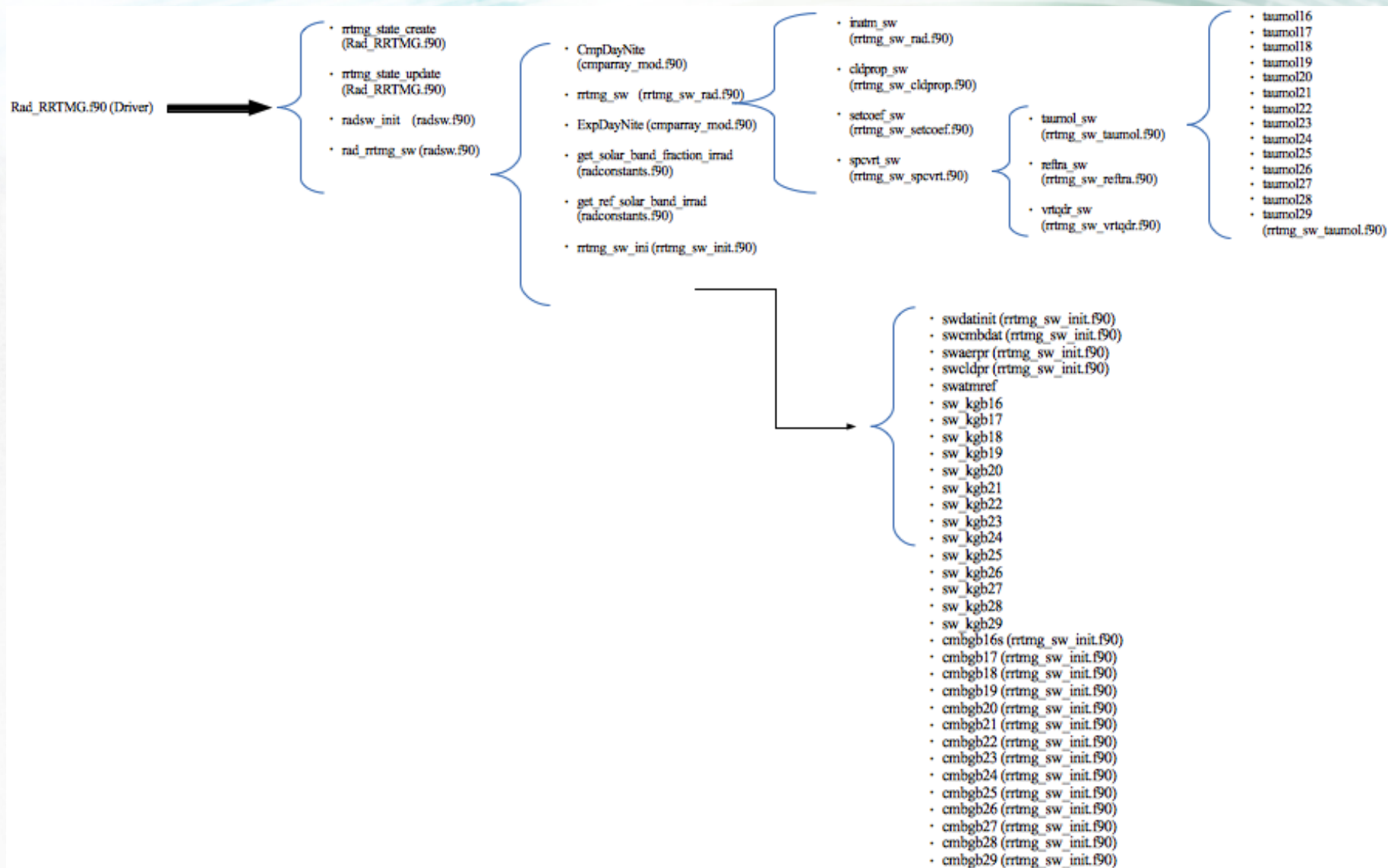
Está preparado para receber Propriedades Ópticas de **Aerossóis**





BESM

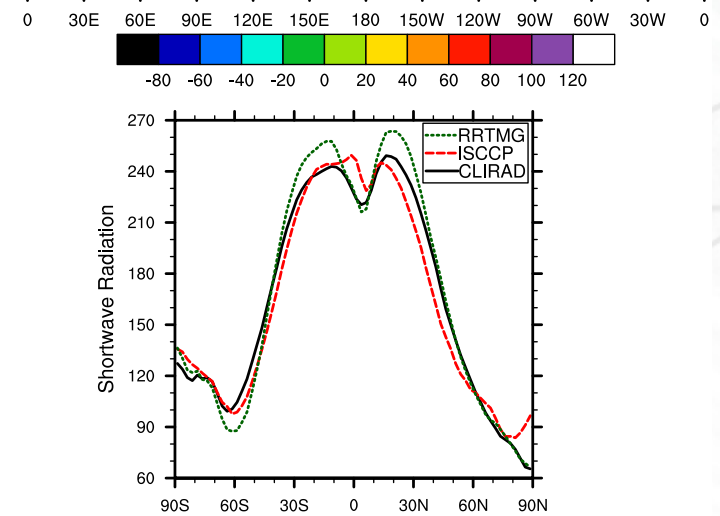
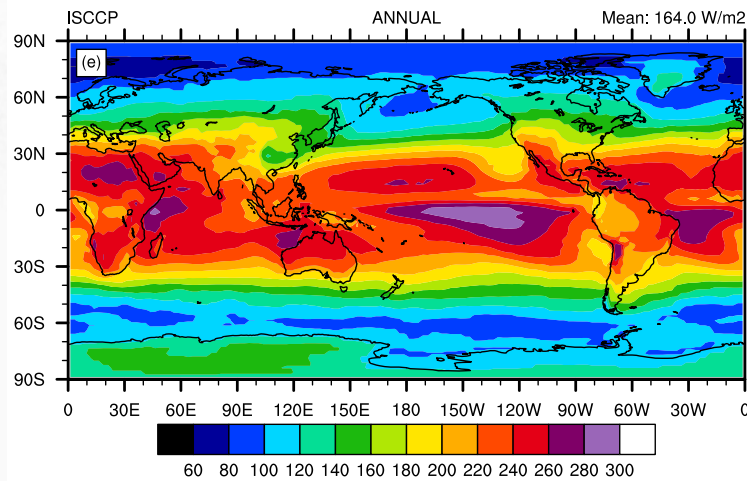
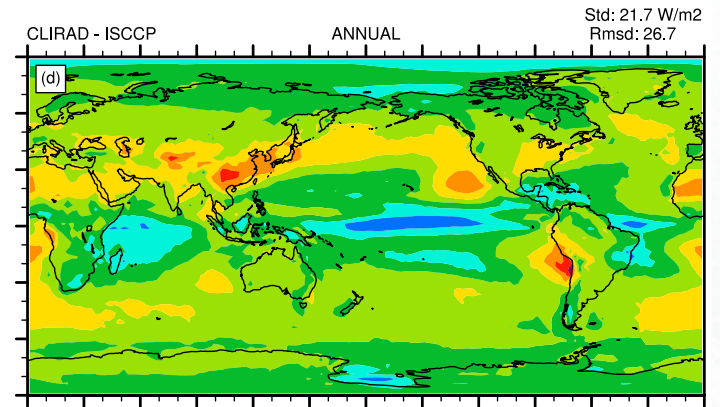
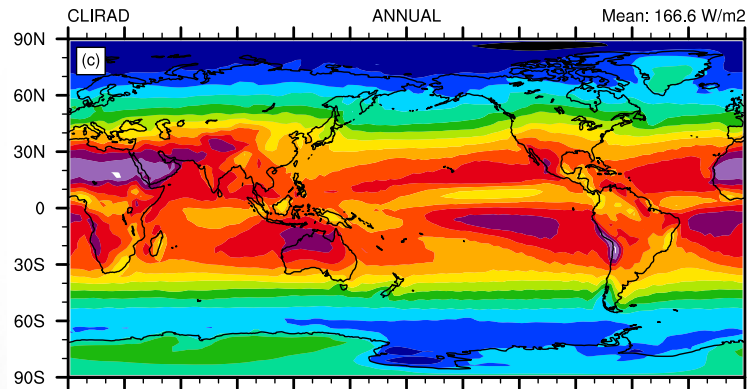
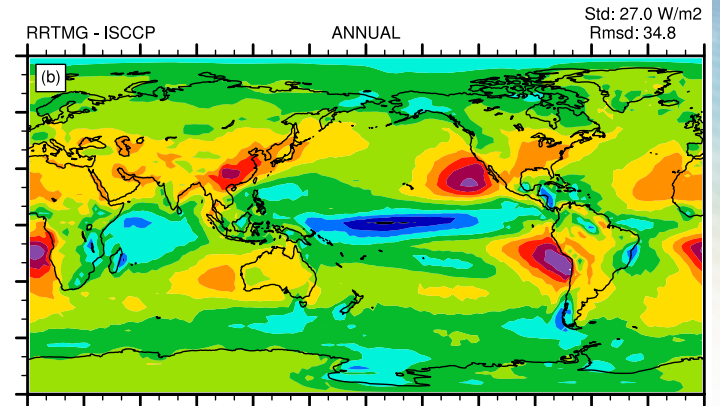
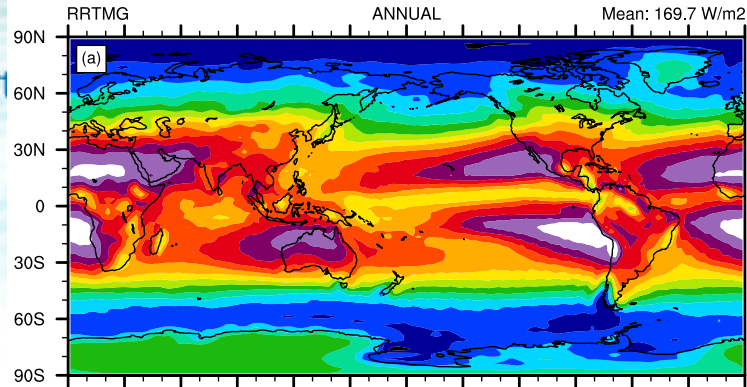
Brazilian Earth System Model





BESM
Brazilian Earth

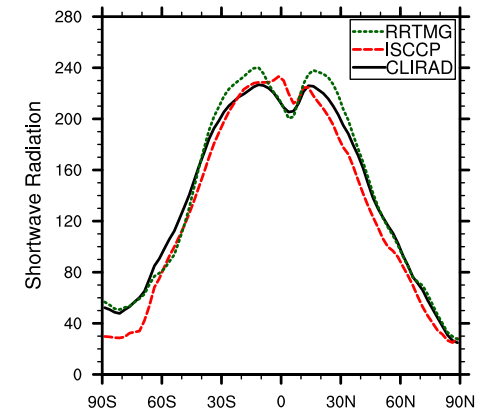
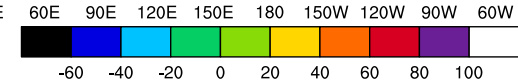
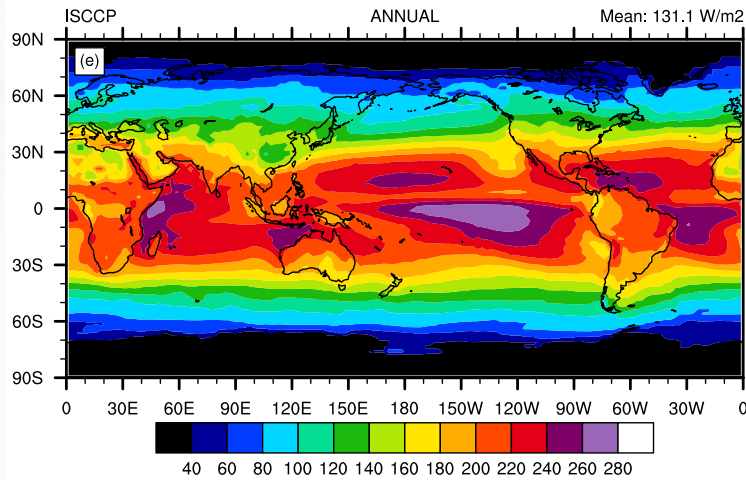
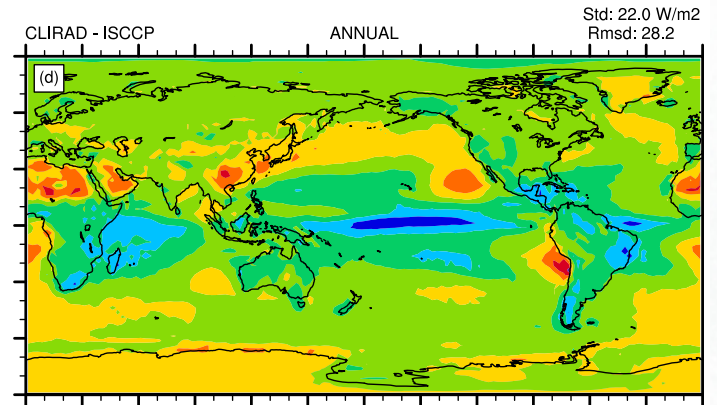
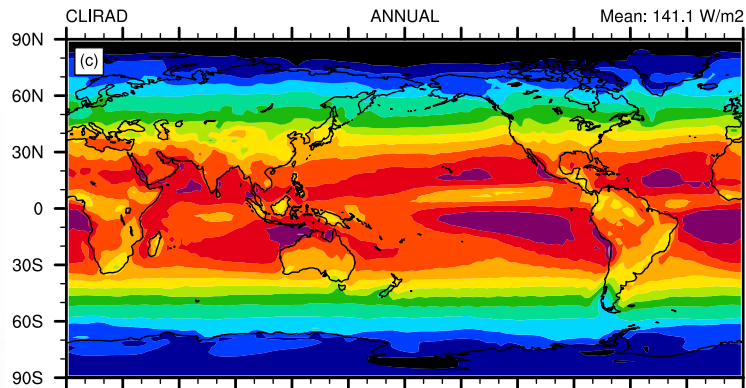
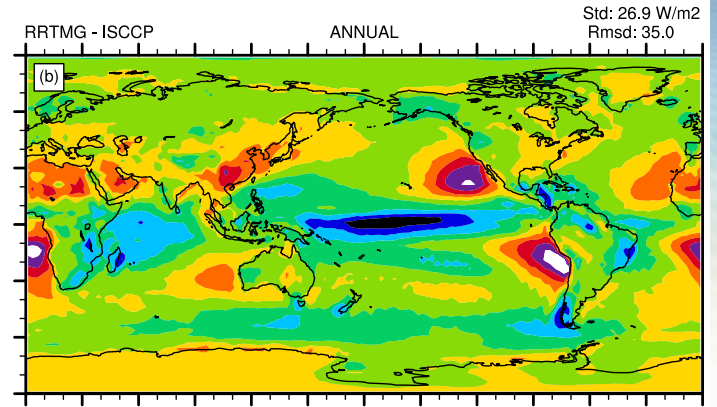
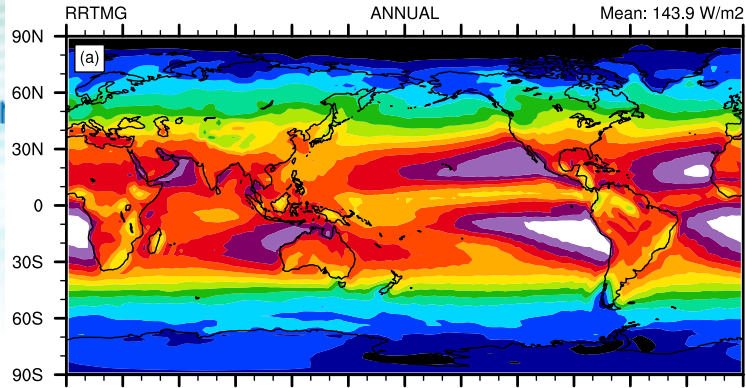
Downward Shortwave at Ground





BESM
Brazilian Earth System Model

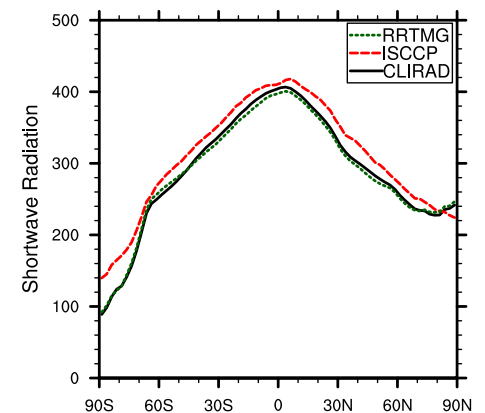
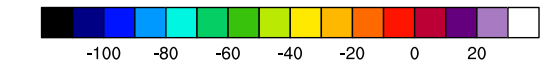
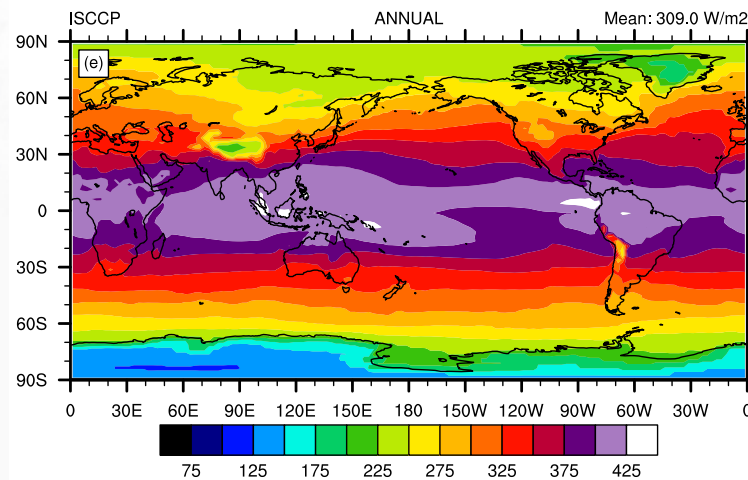
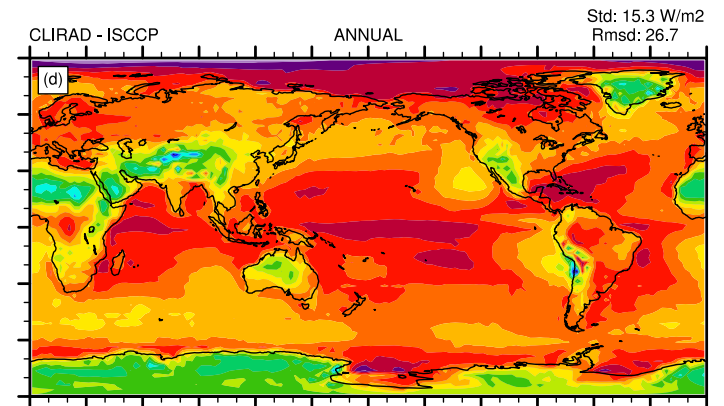
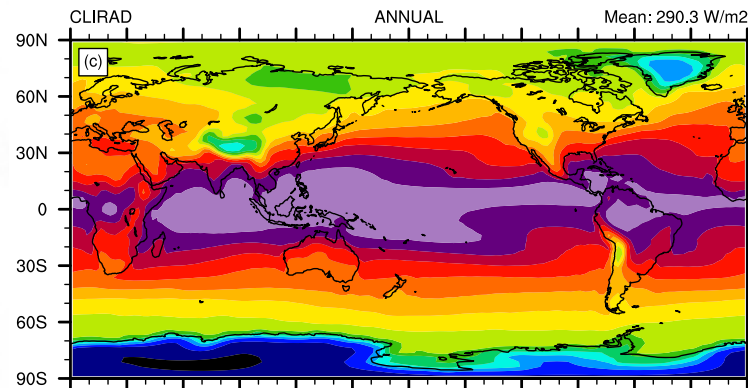
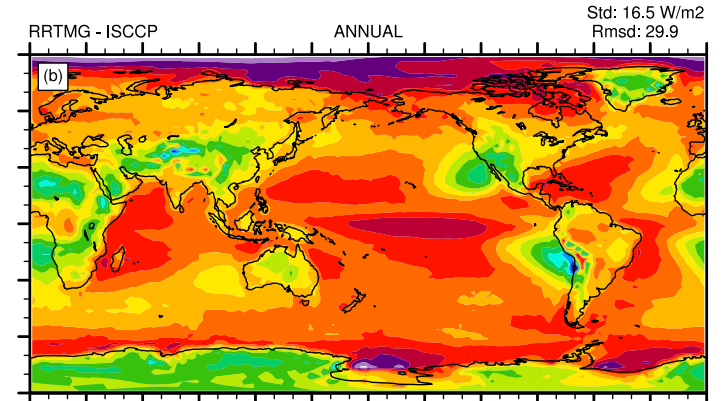
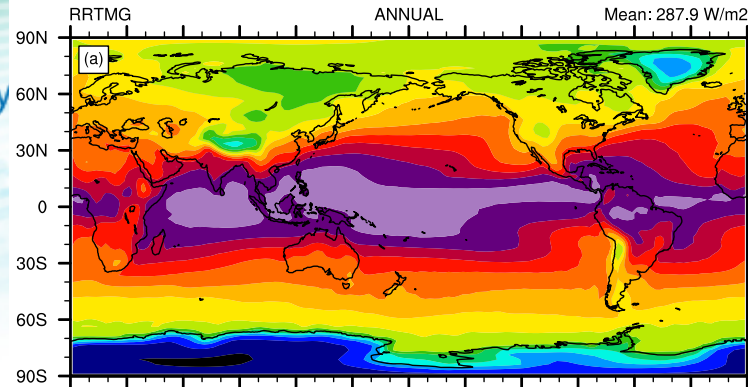
BOC at Ground





BESM
Brazilian Earth Sy

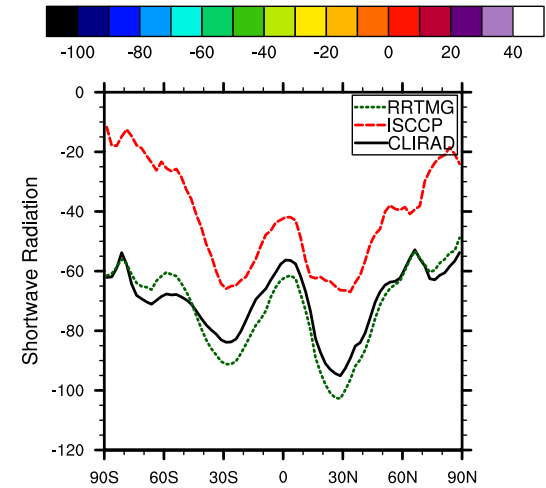
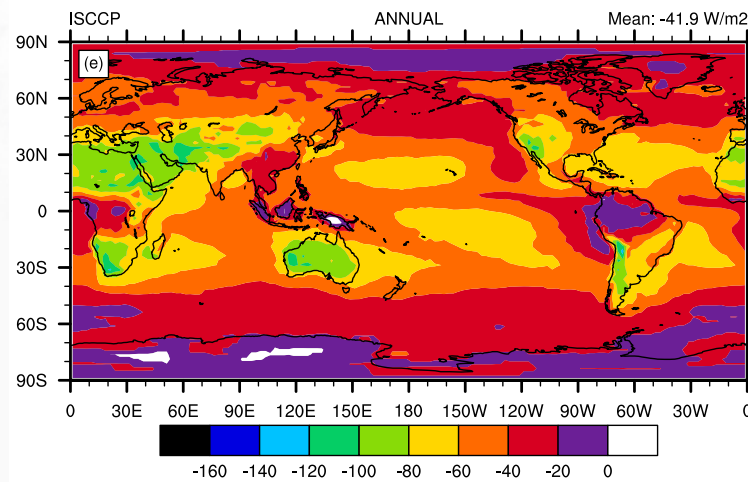
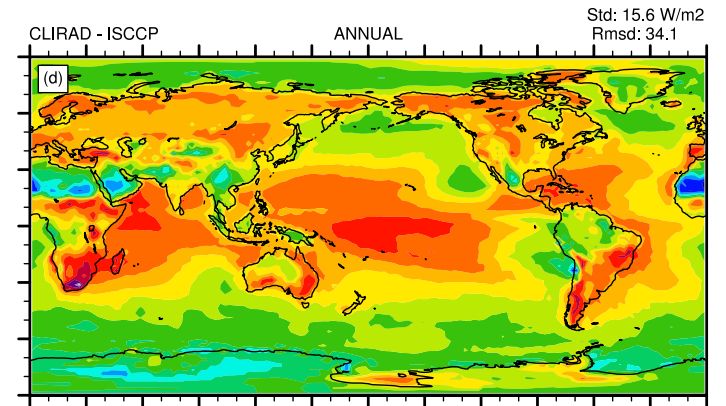
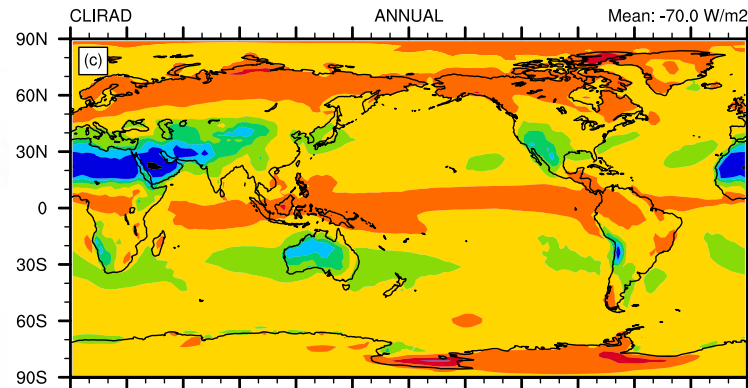
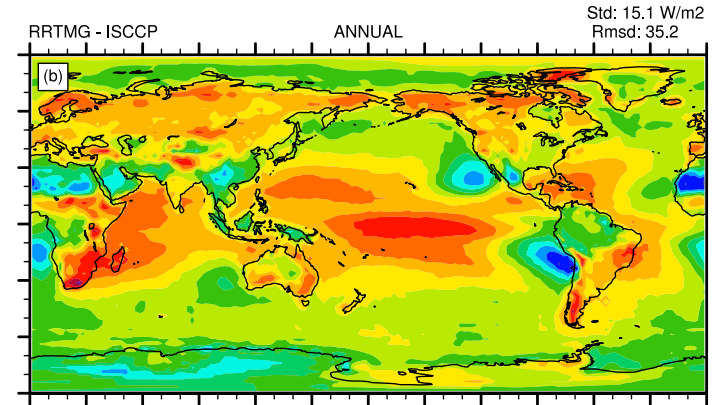
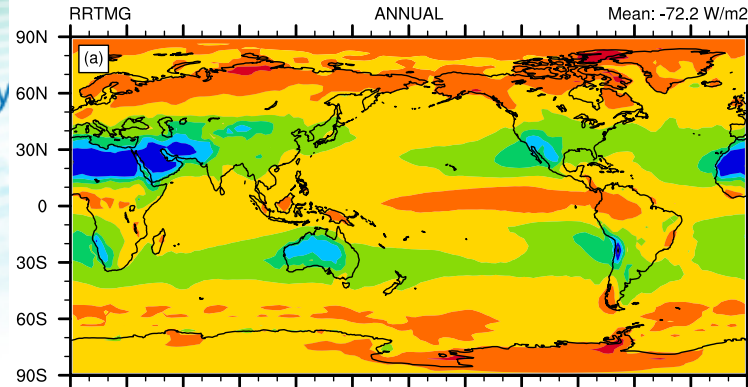
Downward Longwave at Ground





BESM
Brazilian Earth Sy

BOL at Ground





BESM
Brazilian Earth Sy

Net Radiation at Ground

