

Dcpam5 ベンチマーク計算

傾圧不安定実験

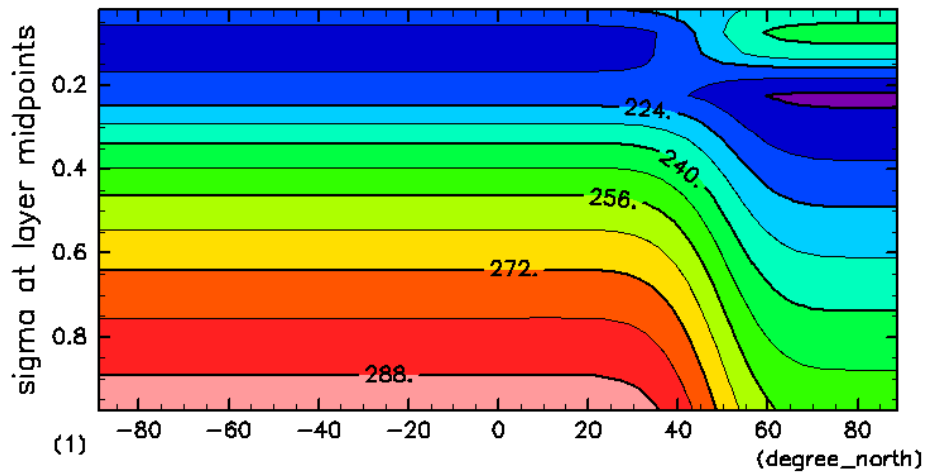
Polvani, L. M., Scott, R. K., Thomas, S. J., 2004:
Numerically converged solutions of the global primitive equations
for testing the dynamical core of atmospheric GCMs
J. Atmos. Sci., 132, 2539--2552

問題設定

- 球面プリミティブ方程式
- 強性項なし、散逸2次の水平粘性
- 地表面は平坦、地表面過程なし
- 解像度 T21L20, T85L20
- 傾圧不安定な場に温度擾乱を与えて時間発展を見る

初期場

temperature



CONTOUR INTERVAL = 8.000E+00

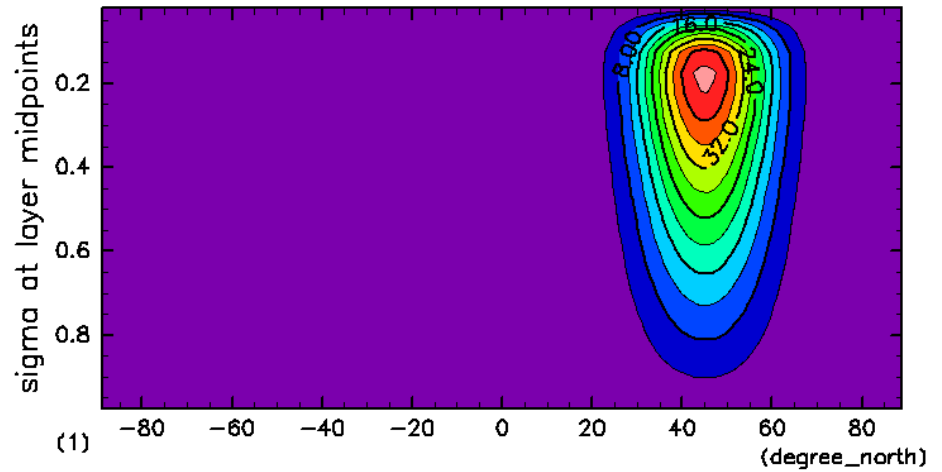


lon=0 degree_east
time=0 sec

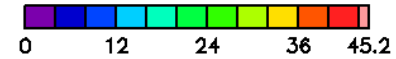
/home/takepira/bin/gpview 2D10-08-18

init_data_primitive_PST2004_T85L20.nc@Temp,lon=0

eastward wind



CONTOUR INTERVAL = 4.000E+00

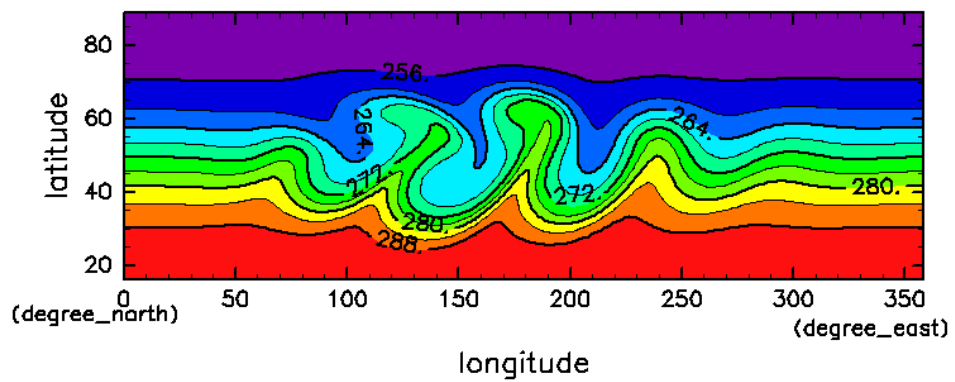


lon=0 degree_east
time=0 sec

init_data_primitive_PST2004_T85L20.nc@U,lon=0

温度場の時間発展

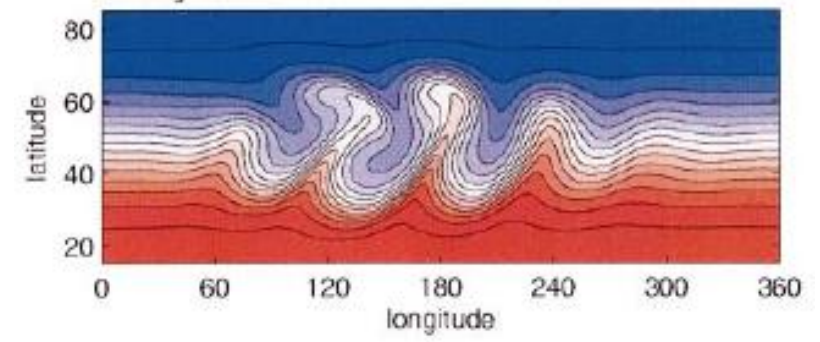
temperature



CONTOUR INTERVAL = 4.000E+00
252 264 276 288

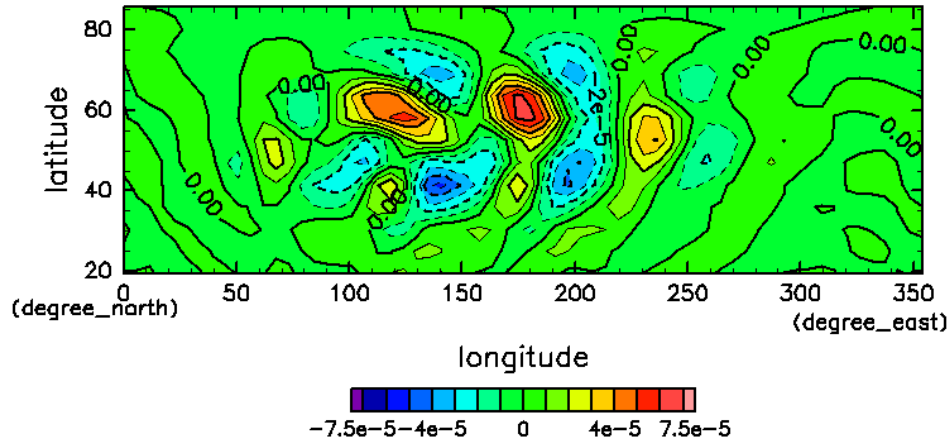
sig=0.974924 1
2000-01-13 00:00:00+0000

e. day 12



渦度場の時間発展

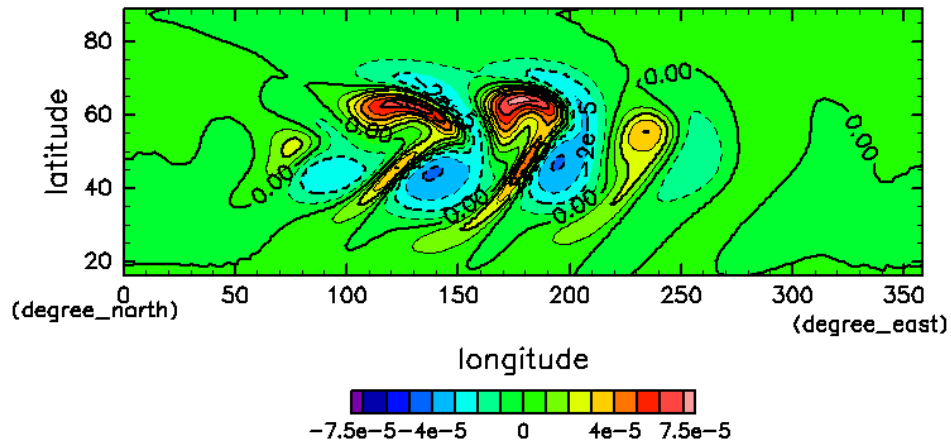
vorticity



sig=0.974924 1
2000-01-13 00:00:00+0000

/home/takepira/bin/gpview 2010-08-18

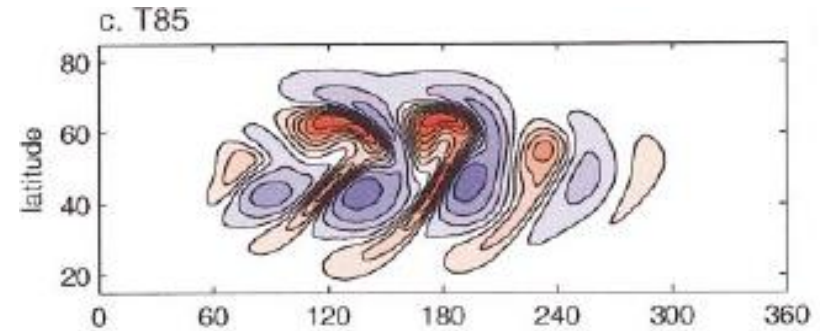
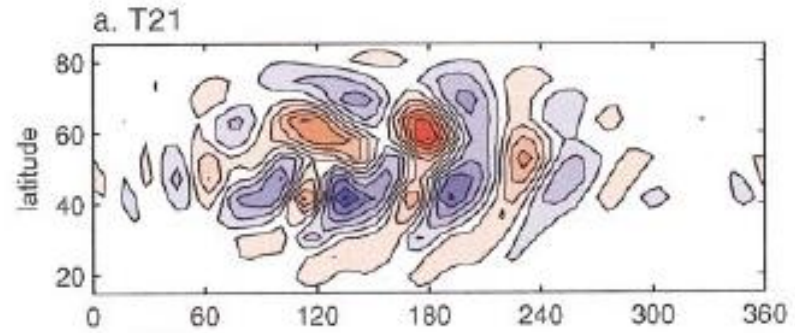
Var.nc@Var,sig=1,time=12,lat=15:90



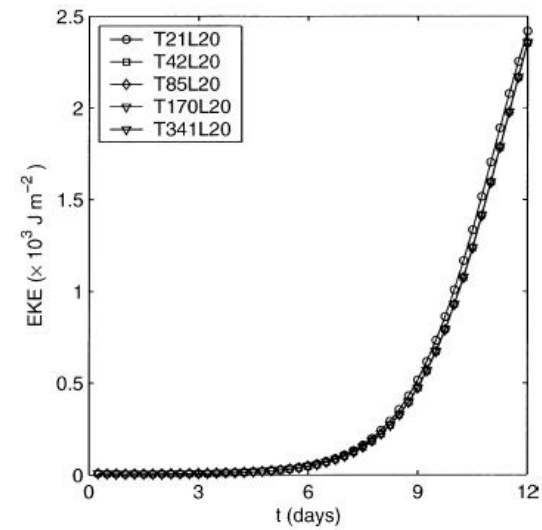
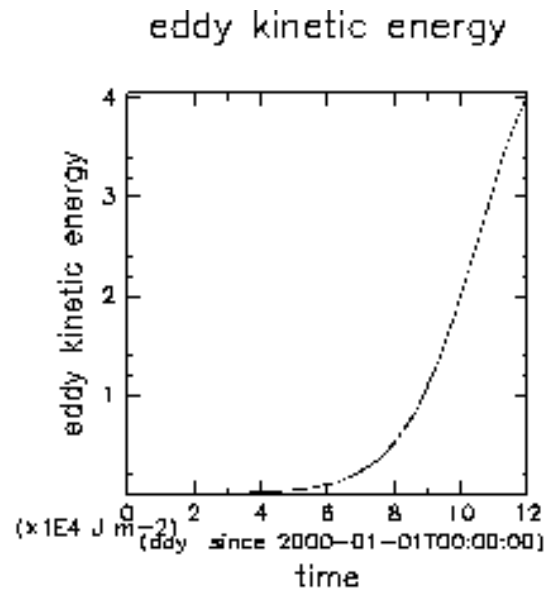
sig=0.974924 1
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/home/takepira/bin/gpview 2010-08-18

Var.nc@Var,sig=1,time=12,lat=15:90

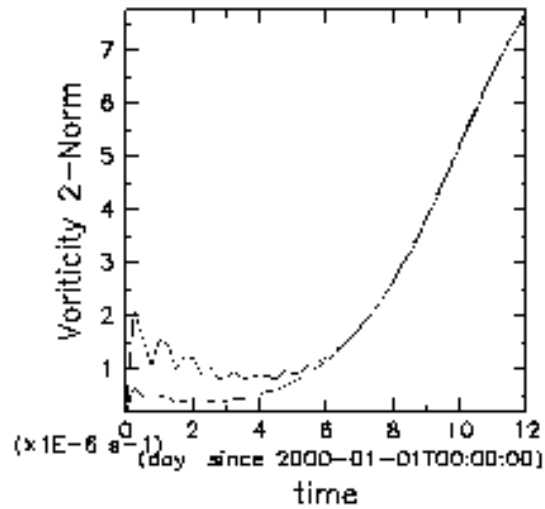


渦運動エネルギー

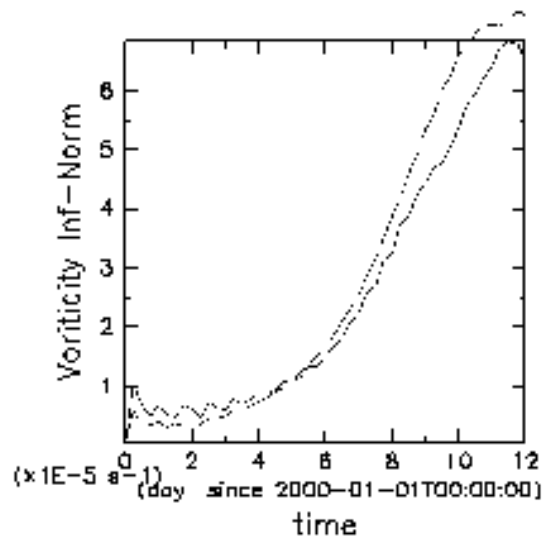


渦度ノルム

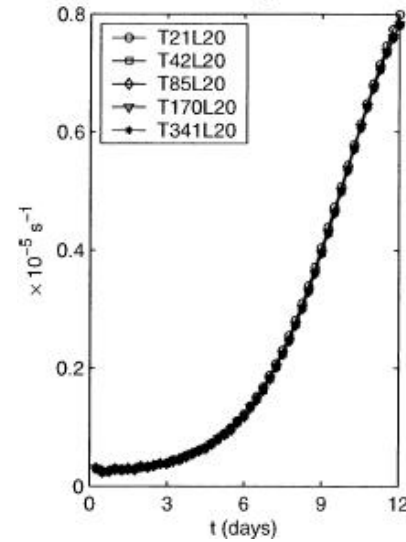
Vorticity 2-Norm



Vorticity Inf-Norm



a. $\|\zeta\|_2$



b. $\|\zeta\|_\infty$

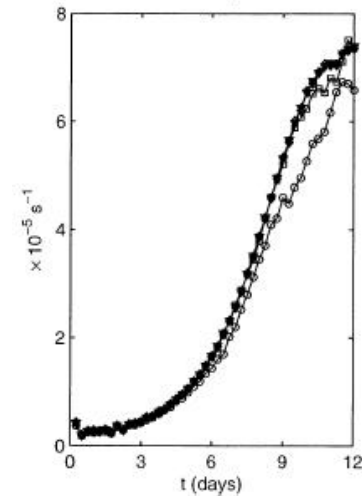


Fig-0.971974

参考文献

Polvani, L. M., Scott, R. K., Thomas, S. J., 2004: Numerically converged solutions of the global primitive equations for testing the dynamical core of atmospheric GCMs, *J. Atmos. Sci.*, 132, 2539–2552

高橋 芳幸, 森川 靖大, 石渡 正樹, 納多 哲史, 佐々木 洋平, 小高 正嗣, 西澤 誠也, 石岡 圭一, 竹広 真一, 中島 健介, 堀之内 武, 林 祥介, DCPAM 開発グループ, 2009: 惑星大気モデル DCPAM,

<http://www.gfd-dennou.org/library/dcpam/>, 地球流体電脳倶楽部.