EULAG model and its application:

http://www.mmm.ucar.edu/eulag/

- International Journal for Numerical Methods in Fluids:

Volume 50 Issue 10 , Pages 1121 - 1293 (10 April 2006)

- Computers & Fluids, Volume 37, Issue 9, October 2008, Pages 1193-1207

'EULAG, a computational model for multiscale flows'

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Optional fluid equations (nonhydrostatic):

- Anelastic
- Compressible/incompressible Boussinesq
- Incompressible Euler/Navier-Stokes'
- Fully compressible for high-speed flows

Available strategies for simulating turbulent dynamics:

- Direct numerical simulation (DNS)
- Large-eddy simulation, explicit and implicit (LES, ILES)

PROBLEMS / CURRENT LIMITATIONS:

No aerosol equations, no chemistry, no surface (ocean/land) coupling, no land/surface model, lack of 3D radiative transfer, lack of data assimilation (forecast not available), surface layer model has to be better prescribed.

This model has been used for my studies,

some results are shown on the electronic poster.

EULAG has been applied in the areas of turbulence, orographic flows, urban flows, gravity wave dynamics, flows past complex/moving boundaries, micrometeorology, cloud microphysics and dynamics, global atmospheric, and basic fluid dynamics of incompressible fluids. Derivatives of EULAG also have been applied to simulations of visco-elastic waves in the human brain, oceanic flows, and stellar convection. Present developments include extensions to gas dynamics and solar MHD.

Global circulation and climate – Held-Suarez test:

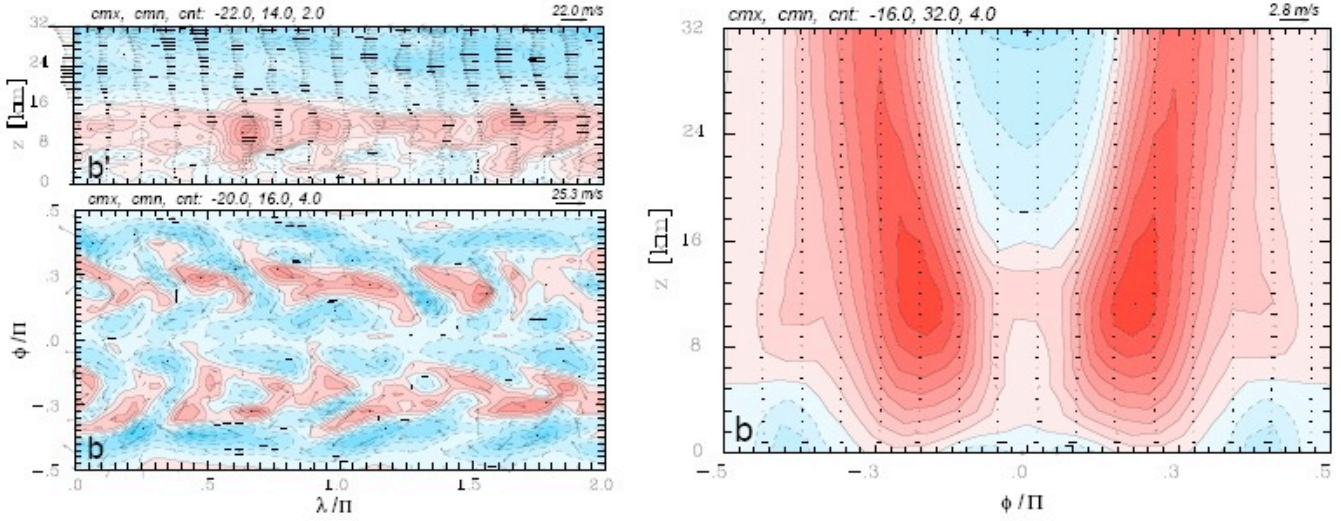

Figure 2: The idealized Held-Suarez climate problem (*BAMS* 1994); instantaneous solution after 3 years of simulation (left), and zonally averaged 3-year means (right) (Sm. et al. *JAS* 2001).

Working on Held – Suarez for Mars ....