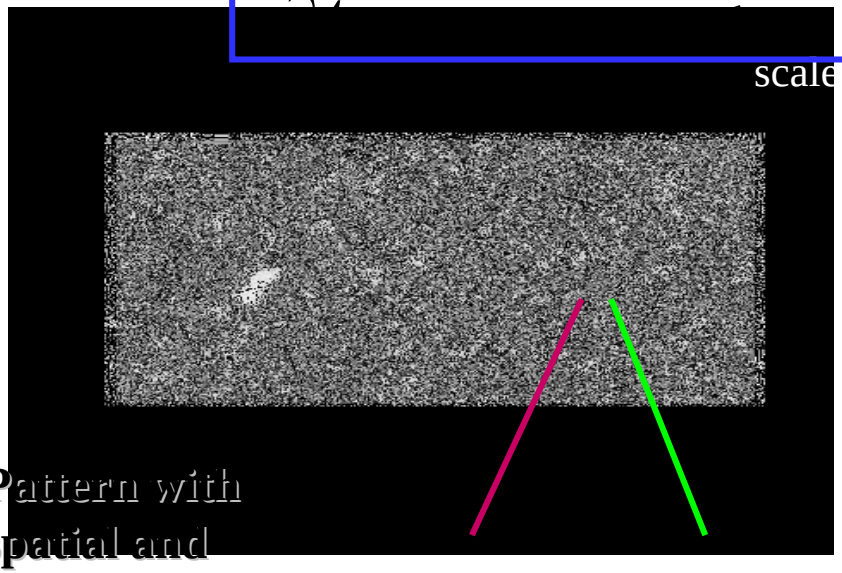
Cellular Automaton Stochastic Backscatter Scheme (CASBS)

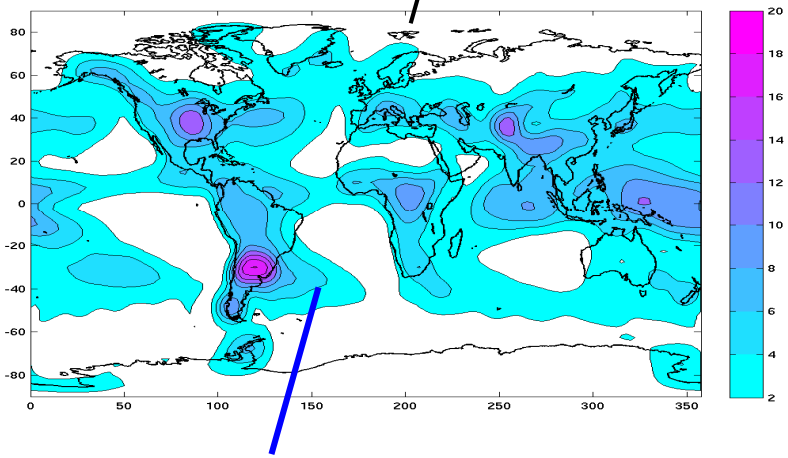
Rationale: A fraction of the dissipated energy is scattered upscale and acts as streamfunction forcing for the resolved-scale flow (LES) (Shutts and Palmer 2004, Shutts 2005)

$$\frac{\partial \psi}{\partial t} = \alpha \cdot \Delta s \cdot \Psi(\lambda, \phi, t) \sqrt{\Delta \tau \cdot D} \; / \; \Delta \tau$$

scale



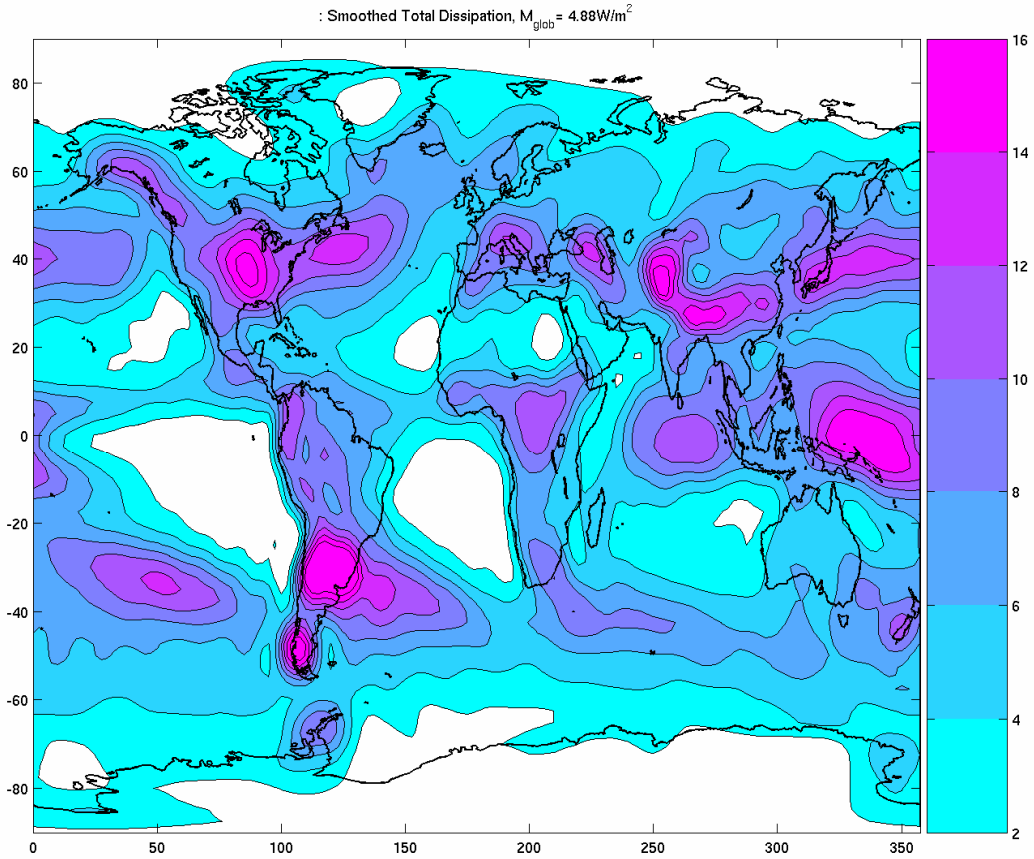
Pattern with spatial and temporal correlations



Dissipation rate

Non-local, quasi-random, state-dependent

Total Dissipation (annual average over 46 dates)



Contributions to Dissipation rate