Geophysical Research Abstracts, Vol. 8, 03400, 2006
SRef-ID: 1607-7962/gra/EGU06-A-03400

Why is the global energy transport so antisymmetric?

R.S. Smith and J. Marotzke

Max-Planck Institute for Meteorology, Hamburg, Germany (smith@dkrz.de)

The meridional energy transport in the Earth System is very nearly antisymmetric about the equator, despite factors such as the asymmetric distribution of surface albedo between the hemispheres, enhanced by obliquity seasons, that would be expected to disturb this pattern. Simple theory also predicts, given an anti-symmetric profile, that the maximum poleward transports should be constrained to be within a fairly narrow latitude band.

Here we use a coupled ocean-atmosphere GCM in a series of highly idealised configurations to investigate the feedbacks and mechanisms involved in this balance. We test the robustness of the antisymmetry to hemispherically asymmetric forcings via changes in the surface albedo, and the extent to which dry and moist processes are required to maintain the balance seen.