Geophysical Research Abstracts,
Vol. 10, EGU2008-A-12118, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-12118
EGU General Assembly 2008

Scaling and Stochastic Parameterization for the Atmosphere

Joseph Tribbia
National Center for Atmospheric Research, USA (tribbia@ucar.edu)

The problem of parameterization of physical process in large scale numerical models of the atmosphere has historically focused upon models of the 'average' or mean tendencies and the models have been of two classes: sub-grid models which depend upon Kolmogorov similarity and those which are developed from idealized process models.

For many sub-grid physical processes little use of scaling structure has been incorporated in the development of parameterizations. I will describe some recent efforts and new strategies aimed at moving beyond the use of process models at large spatial scales for the computation of the sub-grid tendencies due to sub-grid effects of clouds, cumulus convection, orographic drag and radiation. Fractal interpolation of atmospheric fields based on the ideas of Scotti and Meneveau allows process models to be constructed and incorporated on the natural scale of the physical processes by stochastically producing the relevant physical variables at arbitrarily small scale. Comparison with high resolution climate simulations using multi-scale computations with the NCAR WRF model will be presented.