Geophysical Research Abstracts, Vol. 7, 03040, 2005
SRef-ID: 1607-7962/gra/EGU05-A-03040

Changes in the simulated Northern Hemispheric atmospheric variability due to extratropical oceanic variability

D. Dommenget
IFM-GEOMAR

The low frequency atmospheric variability of the Northern hemisphere in two simulations with the ECHAM5 atmospheric GCM model one with and one without extratropical SST variability have been analyzed, in order to determine the influence of extra tropical SST variability onto the mean and variance of 500hPa geopotential height.

Significant changes in the mean state have been found in all seasons, indicating a nonlinear impact of SST variability onto the atmospheric mean state. Changes in the mean state and in the variability are found to be quite different in the different seasons. The strongest changes in the atmospheric variability are found in the summer season. The winter and fall season exhibit strong changes in the atmospheric variability too and changes in the spring season are the least significant.

The Pacific region shows stronger changes in the atmospheric variability for all seasons than the Atlantic region. Changes in the spatial organization are significant in the Pacific for all seasons. The overall tendency for fewer spatial degrees of freedom, if SST variability is present, indicates that SST variability is amplifying atmospheric variability of larger spatial structures.

The linear SST regression onto the leading modes of atmospheric variability is much too weak to explain the changes in the atmospheric variability, which indicates that no inear