Geophysical Research Abstracts, Vol. 8, 07222, 2006
SRef-ID: 1607-7962/gra/EGU06-A-07222

Study of the North Atlantic storm tracks simulated by the French OAGCMs Arpège-Climat and IPSL-CM4 under warm conditions (4*CO2)

A. Laîné, M. Kageyama

LSCE/IPSL, Laboratoire des Sciences du Climat et de l'Environnement, France
(alexandre.laine@cea.fr / Fax: +33 1-69-08-77-16 / Phone: +33 1-69-08-31-97)

Mid-latitude storm tracks constitute a fundamental component of the climate system through their role in advecting heat and moisture polewards. Their fronts are also responsible for most of the winter precipitation in the mid-latitudes, especially in Western Europe. It is therefore important to study their behaviour within the climate change context.

Changes of this synoptic variability is analysed by comparing CMIP/IPCC pre-industrial and stabilized 4*CO2 simulations for the two French Ocean-Atmosphere general circulation models IPSL-CM4 and Arpège-Climat (Météo-France). The comparison between the two models, performed within the ESCRIME project, points out towards strong differences. The North Atlantic storm track activity is strengthened and expands more in the zonal direction in the 4*CO2 climate compared to pre-industrial conditions for Arpège-Climat whereas it becomes weaker and deviated to the North when approaching Europe for IPSL-CM4. Those differences can be explained by opposite changes in the baroclinic instability due to different sea surface conditions in some key-northern regions, especially the Labrador and the GIN (Greenland-Island-Norway) Seas.