Geophysical Research Abstracts, Vol. 8, 05777, 2006
SRef-ID:

Changes of regional climate means and of variability along the 45-50° N latitudes according to the IPCC TAR climate models

V. Schlanger (1), Cs. Máthé (2) and J. Mika (1)

(1) Hungarian Meteorological Service, 1525 Budapest, P. O. Box 38, schlanger.v@met.hu (2) Faculty of Geography, Babes-Bolyai University, Cluj-Napoca, Clinicilor 5-7, Romania

Statistical elaboration of a large number of GCM outputs may reduce the uncertainty of climate prediction for a selected region. Hence, temperature and precipitation results of 17 GCMs are used to outline the longitudinal differences in simulated regional changes along a temperate latitude belt. The 45-50 N belt is selected with a wide variety of lowlands and mountains, warm and cold sectors of oceans. The MAGICC/SCENGEN version 4.1 software (Wigley et al., 2003) is used to obtain and synchronise the model outputs. The aim of the study is to assess the quality and divergence of regional simulations, and to see the geographical differences within the geographical belt. Differences between the individual model outputs are not analysed. Results related to years 2025 and 2100 are mainly demonstrated, expecting a moderate IPCC greenhouse-warming scenario. Aerosol effects are separately quantified for 2025, only.

Average of the 17 GCMs captures the zonal differences of annual mean temperature and precipitation fairly well along the belt in the present climate, but with typical underestimation of the actual values, especially in case of precipitation. Spatial correlation of the annual mean changes among the possible 136 pairs of GCMs is often low, especially for precipitation: share of the >0.7 correlation coefficients is only 15 % for the temperature and 0 % for the precipitation changes. The concept of continentality can be applied for the changes of temperature, as well, since the warming is much slighter above the oceans than above the continents in the given belt, and the relevant difference within the continents and among the seasons are seen, as well. Inclusion of sulphate aerosols decreases not only the absolute changes, but this continentality,

too. Annual precipitation changes exhibit positive sign except western and central Europe in the belt, whereas seasonal changes already show rather hectic nature along the belt. Hectic behaviour is observed in changes of diurnal standard deviation every season with no clear differences according to the type of the underlying surface. In overwhelming majority of the longitudes, however, increase of the diurnal variability is typical in both weather elements in the investigated 45-50 N latitudinal belt.