Geophysical Research Abstracts, Vol. 9, 07072, 2007
SRef-ID: 1607-7962/gra/EGU2007-A-07072

Implications of enhanced persistence of atmospheric circulation over Europe for the occurrence and severity of temperature extremes

J. Kysely

Institute of Atmospheric Physics AS CR, Prague, Czech Republic (email: kysely@ufa.cas.cz)

Relationships between persistent atmospheric circulation patterns over Europe and surface air temperature anomalies are studied over the 20th century using the Hess-Brezowsky catalogue of circulation types and temperature data from European stations with long-term measurements. Circulation types significantly conducive to heat and cold waves are detected. It is demonstrated that temperature extremes become more pronounced under more persistent circulation; the consequences vary for warm and cold extremes and among sites, depending on features related to atmospheric dynamics (e.g. air-mass advection and fronts). The intensification due to the higher persistence of circulation patterns is more important for warm than cold events. The results support a hypothesis that the recently observed increases in the frequency and severity of heat waves over Europe are related to the enhanced persistence of the atmospheric circulation. Impacts of the expected climate change on the occurrence and severity of temperature extremes may be exacerbated by more persistent circulation patterns over the European mid-latitudes.