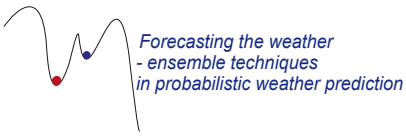
EMS Annual Meeting Abstracts
Vol. 8, EMS2011-171-2, 2011
11th EMS / 10th ECAM



Is high frequency temperature variability becoming more extreme?

M. Hofstätter and J. Hiebl

Central Institute of Meteorology and Geodynamics, Climate Research Department, Vienna, Austria
(m.hofstaetter@zamg.ac.at)

Against the backdrop of rising global mean temperatures, issues on enhanced climate variability and increasing extremes attract wide interest not only in the scientific community but also in the public climate change debate.

Whereas several studies are dealing with climate variability by using classical definitions like absolute minima or maxima, q-quantile ranges or the standard deviation, the authors present a novel approach to objectify the issue of changes in high-frequency climate variability of daily mean temperature. Describing multi-day anomaly episodes, three indices expressing temperature changeability, deviancy and overall variability are established. To interpret temporal changes and trends in variability solidly, the objective is to maintain comparability among different temperature anomaly episodes, irrespective of any seasonality or long-term trend of the reference state.

Climate variability indices of five station records spanning 117-139 years reveal that rising temperatures go ahead with weaker - but in parts still significant - increasing trends of both changeability and deviancy in the 20th century. Nevertheless, early 21st century's level of temperature variability is very much comparable to late 19th century's pre-greenhouse climate state. Although variability measures exhibit large interannual to multidecadal fluctuations, long-term stability is a main feature of temperature climate's variability in the study period.