Geophysical Research Abstracts,
Vol. 10, EGU2008-A-10365, 2008
SRef-ID: 1607-7962/gra/EGU2008-A-10365
EGU General Assembly 2008

Statistical adaptation of mesoscale numerical weather forecasts for the predictive control of indoor building climate

V.J. Stauch
Federal Office of Meteorology and Climatology (MeteoSwiss), Zurich, Switzerland

The direct output of numerical weather prediction (NWP) models yields, amongst others, forecasts of near surface weather variables gridded on a defined spatial resolution. The output at each gridpoint is assumed to represent a spatial average of the weather conditions around that gridpoint. Therefore, to derive predictions for a particular location within the model area some post-processing procedure is required that corrects for the specific local conditions. So called statistical downscaling methods have been developed to tackle this problem that aim to derive systematic relationships between time series of NWP model outputs and local observations. The identified relationships can be parametric, (e.g. based on uni- or multivariate (non-)linear regressions) or nonparametric (e.g. based on cluster analysis or analogues) and are derived from both, long re-analysis data and re-forecasts of NWP models along with long-term surface observations. However, these methods rely on constant NWP model characteristics rarely preserved in the operational NWP production. Alternatively, adaptive approaches based on Kalman filter formulations do not require conservative model characteristics and have produced promising results in the local correction particularly for the 2m temperature.

Here, the potential of several statistical adaptation approaches for the local correction of 2m temperature and global radiation forecasts produced by the mesoscale (7km resolution) NWP model COSMO will be explored. First, we demonstrate their forecast performance compared to the direct model output with common verification methods. In a second part, we show their benefit when being used in a predictive control

application for integrated room automation.