



## **Analysis and Improvement of Statistical Error in Forecasted Air Temperature**

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The main aim of this study was to improve forecasted 2 meter air temperature from the numerical weather prediction (NWP) model (called – HIRLAM – High Resolution Limited Area Model) output. In particular, behaviour in the 2m air temperature errors for 66 selected Danish synoptical stations was studied and a parameterization based on statistical approach was suggested. For synoptical stations, a dataset of forecasts and observations of four meteorological parameters (2m air temperature, dew temperature, surface temperature, and wind speed; covering period 1 May - 31 Aug 2012) was analysed. It has been found that the involved meteorological parameters followed several criteria (distribution close to normal, periodicity on a diurnal cycle and strong correlation) which are necessary to have an efficient correction of the air temperature. In this study, a parameterization for the improvement of the air temperature forecast based on estimation of an average shift of the density function for 2m air temperature error compared with the standard normal distribution shape was elaborated, tested and verified for different times of the day, different forecast lengths and different month of the studied period. The parameterization describing correction to temperature is based on a trigonometric function and can be applied for any forecast length. The developed parameterization was tested for individual and groups of stations. A strong correlation between temperatures was identified for two groups of stations: 1) high error stations (HES) and airport stations (AS). It showed improvement and good agreement with observations for the HES group of stations for all times and forecast lengths in all months. And for AS stations the improvement was more visible in May and Jul 2012. The developed parameterization can be implemented for operational tasks of numerical weather prediction.