# Correcting prognostic GRIB data using hi-resolution 3D Lagrangian model.

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Multiple cases of serious mismatches between prognostic and observation data, especially in mountainous areas and in regions with poor meteo-stations covering, leaded to the idea of correcting macroscale models' data. These mismatches are caused by 2 main reasons: macro models normally use topography smoothing and thus lower the topography detailing; these models use low-resolution grids, which cannot provide precise calculations. Figure 1 shows you relative error of the 12-hour surface air temperature forecast in Alpine region, figure 2 – around the Yakutsk city. As you can see, these errors can reach up to 20 °C.

To correct prognostic data from macroscale models hi-resolution 3D Lagrangian mesoscale model was developed. This model's input data consist of prognostic GRIB data from big meteorological centers' models, combined (if needed) with surface and aerological observation data. Vertical distribution of wind, temperature and humidity, as well as turbulence characteristics in the lower troposphere are calculated by means of geophysical boundary layer model. [1]

To use terrain data most effectively, model is working in σ-coordinates. While being hi-resolution model using detailed topography data, our model can work on personal computers, i.e. it requires low processor power. Another advantage is its flexible and user-friendly interface, allowing operator not only to specify the model resolution and the vertical levels set according to his needs, but also to set new working territory in several minutes.

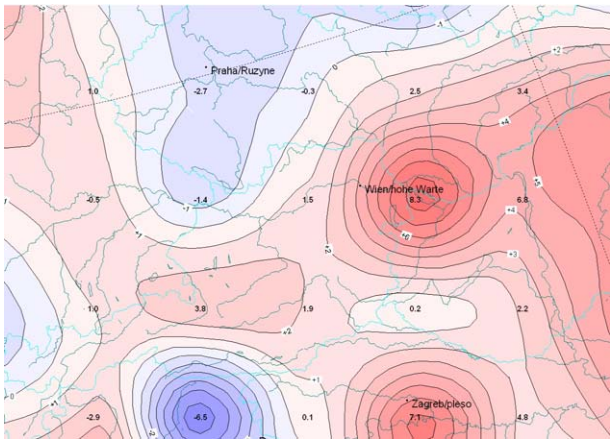


Fig. 1 – Alpine region

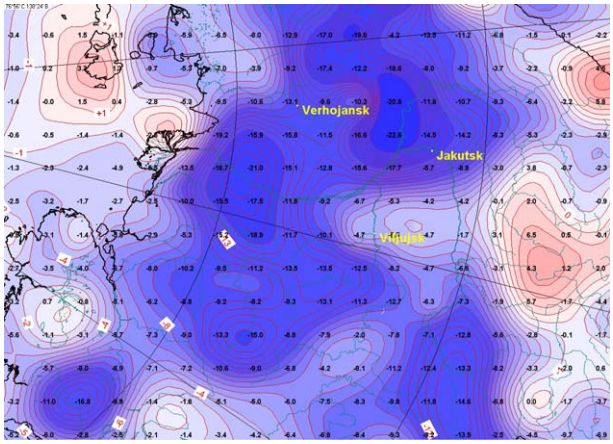


Fig. 2 – around Yakutsk city

## References:

1. Berkovich, L.V., Tarnopolskii, A.G., Shnaydman, V.A.: 1997, "A Hydrodynamic Model of the Atmospheric and Oceanic Boundary Layers," Russian Meteorology and Hydrology 7, 30-40
2. Belousov, S.L., Berkovich, L.V., Yusupov Y.I.: 1994, "Short-range Hydrodynamical Weather Forecasting by Means of Automated Workstation Technology," Russian Meteorology and Hydrology 11, 40-52.