Application and verification of ECMWF products 2008

Environmental Agency of Slovenia – Meteorological office

1. Summary of major highlights

The whole suite of ECMWF products is used as fundamental source of forecast information in Meteorological Office of Environmental Agency of Slovenia. The decisions based upon this information range from day to day weather forecasting to specialised forecasts prepared for particularly demanding users. The system for short range surface and upper air NWP verification has been implemented where performance of ECMWF deterministic model is compared to other NWP sources of data available at Environmental Agency of Slovenia (numerous different versions of ALADIN model and NMM). Kalman filtering and MOS of ECMWF products are used operationally.

2. Use and application of products

The ECMWF deterministic and EPS products are used as basis and support for subjective and automatic production of forecasts at short and medium range. The ECMWF model is used extensively as a source of data for automatic forecasts production for Internet distributed products gaining importance. More and more focus has been put to the monthly and seasonal forecasts which are however only used and subjectively interpreted internally.

2.1 Post-processing of model output

2.1.1 Statistical adaptation

Kalman filtering is used for improving the T2m forecasts. MOS is performed operationally, giving the information about temperature forecast as well as the information about the level of confidence of the forecast.

2.1.2 Physical adaptation

The ECMWF deterministic output has been used as coupling data for semi-operational runs of WRF/NMM model for the region of Alps and North Adriatic. The ECMWF deterministic runs are also used as boundary conditions for COAMPS model in the research mode.

2.1.3 Derived fields

The EPS clusters and probabilities are computed and visualized locally. The ECMWF wind fields are used for the calculation of forward and backward trajectories for the use of Civil protection authorities.

2.2 Use of products

3. Verification of products

The ECMWF deterministic point forecasts for surface and upper air are stored into verification database in the scope of ALADIN verification project. Users with interactive access can create their own traditional score reports for number of selected locations, areas and forecast ranges. They can compare the skill of different models including deterministic forecast of ECMWF .

There have been no efforts invested into objective verification of ensemble, monthly and seasonal forecast

3.1 Objective verification

3.1.1 Direct ECMWF model output (both deterministic and EPS)

3.1.2 ECMWF model output compared to other NWP models

3.1.3 Post-processed products

3.1.4 End products delivered to users

EPS meteograms for winter sport centres during winter season.

3.2 Subjective verification

3.2.1 Subjective scores (including evaluation of confidence indices when available)

No systematic subjective verification has been undertaken in the last year.

3.2.2 Synoptic studies

The deterministic model behaviour and the skill of ensamble forecasts (in particular EFI) was studied in detail for one extreme precipitation event which occurred on 18.Sept. 2007. The nature of the event (stationary orographicaly triggered convection) prevented the model from quantitatively correct forecast, however the model (EFI) indicated the extreme characteristics of event.

4. References to relevant publications

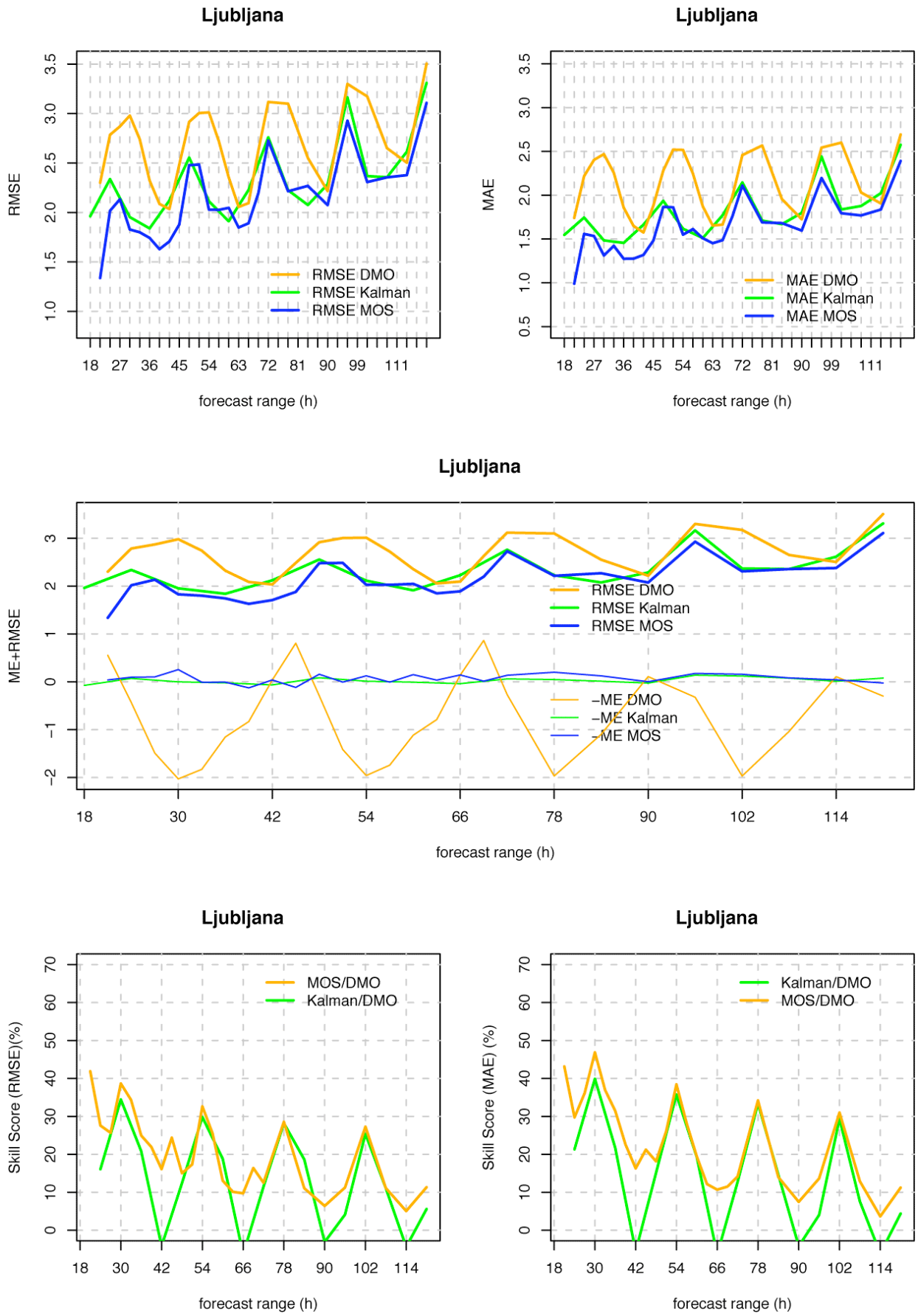

Fig. 1 Comparison of RMSE, MAE and ME for T2m forecast based on ECMWF deterministic forecast, 12 UTC: Direct Model Output (DMO), DMO with Kalman correction (DMO Kalman) and Model Output Statistics (MOS) and Skill Score (RMSE - RMSEref)/(RMSEperf-RMSEref)*100%) of MOS T2m forecast and Kalman corrected T2m in reference to DMO, based on ECMWF deterministic forecast, 12 UTC. Verification period is 1.1.2007 till 31.12.2007. Location: Ljubljana (14015)

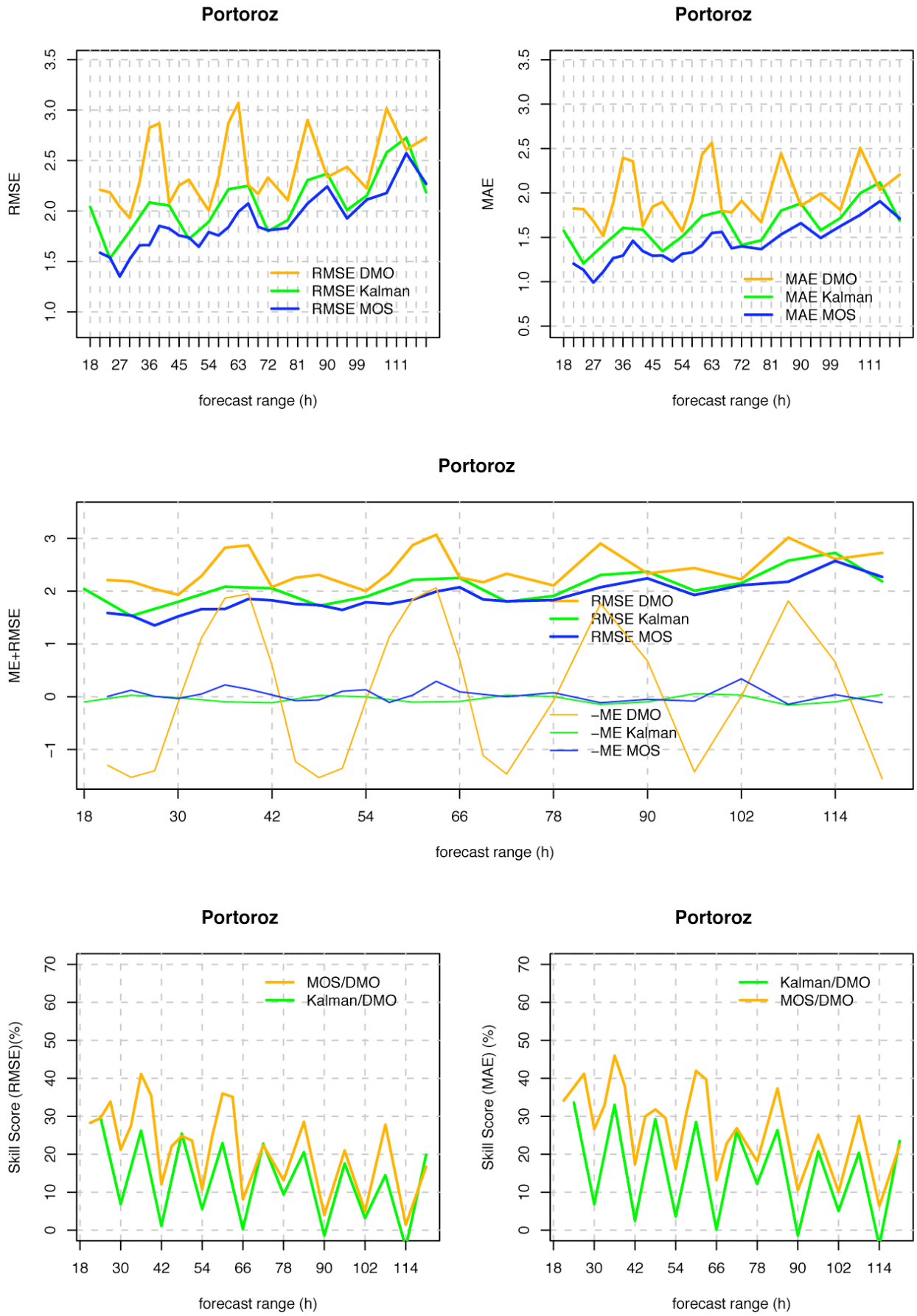

Fig. 2 Comparison of RMSE, MAE and ME for T2m forecast based on ECMWF deterministic forecast, 12 UTC: Direct Model Output (DMO), DMO with Kalman correction (DMO Kalman) and Model Output Statistics (MOS) and Skill Score (RMSE - RMSEref)/(RMSEperf-RMSEref)*100%) of MOS T2m forecast and Kalman corrected T2m in reference to DMO, based on ECMWF deterministic forecast, 12 UTC. Verification period is 1.2.2006 till 31.12.2007. Location: Portoroz (14105).

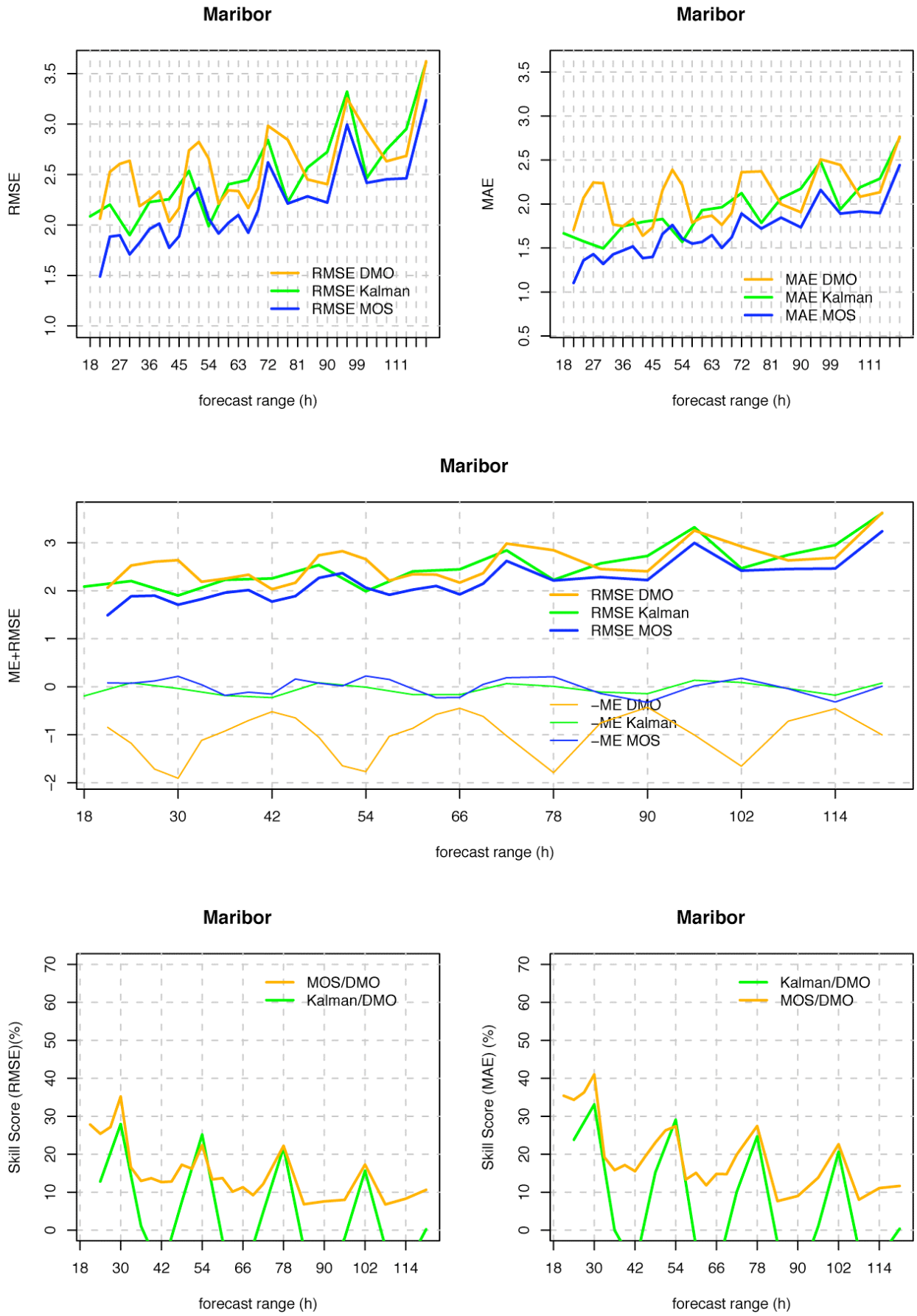

Fig. 3 Comparison of RMSE, MAE and ME for T2m forecast based on ECMWF deterministic forecast, 12 UTC: Direct Model Output (DMO), DMO with Kalman correction (DMO Kalman) and Model Output Statistics (MOS) and Skill Score (RMSE - RMSEref)/(RMSEperf-RMSEref)*100%) of MOS T2m forecast and Kalman corrected T2m in reference to DMO, based on ECMWF deterministic forecast, 12 UTC. Verification period is 1.2.2006 till 31.12.2007. Location: Maribor (14026)