ALADIN related activities @SHMU

25th ALADIN Workshop & HIRLAM All Staff Meeting, 13-17 April 2015, Elsinore, Denmark

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ALADIN/SHMU system

Assimilation cycle

CANARI surface analysis & upper-air spectral blending by DFI

Suite characteristics

4 runs/day (00, 06, 12, 18 UTC), forecast length +72h (3 days), coupled to ARPEGE with 3h frequency

high resolution e-suite on CY38T1bf03 over the same domain since 01/06/2014 (4min vs. ~40min)

Plans: operational with ALARO-1 after HPC upgrade (POVAPSYS project, spring/summer 2015?)

|	operational	E-suite
horizontal resolution	9x9km	4.5x4.5km
no. of points	320x288	625x576
spectral trunc & grid	106x95 quadratic	312x287 linear
vertical levels	37	63
orography	envelope	mean (old Z0)
cycle	CY36T1	CY38T1bf03_export

IT and infrastructure upgrade in frame of the POVAPSYS project (Flood Warning and Forecasting System of the Slovak Republic) - to be completed in 2015
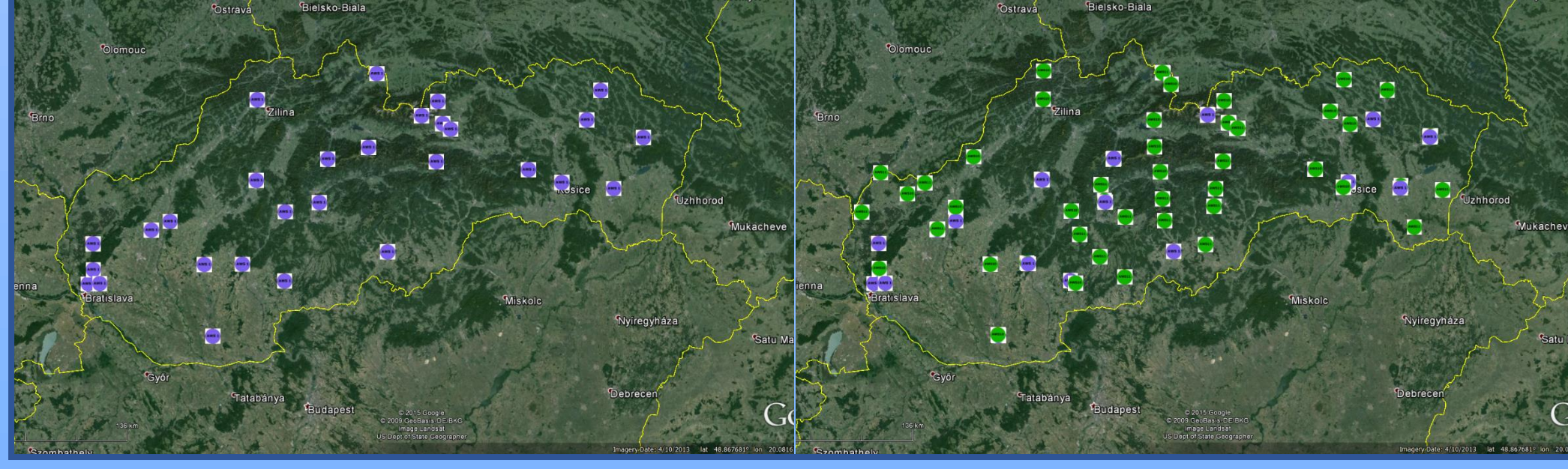
New computer hall, HPC upgrade

Current HPC	New HPC (~1.26x)
IBM p755	IBM Flex System p460
4x Power7 8core CPUs (3.6 GHz), 256 GB RAM	4x Power7+ 8core CPUs (3.6 GHz), 256 GB RAM
10 nodes	12 nodes
AIX 6 SE OS	Red Hat Enterprise Linux

Radar network: 2 upgraded + 2 new installed
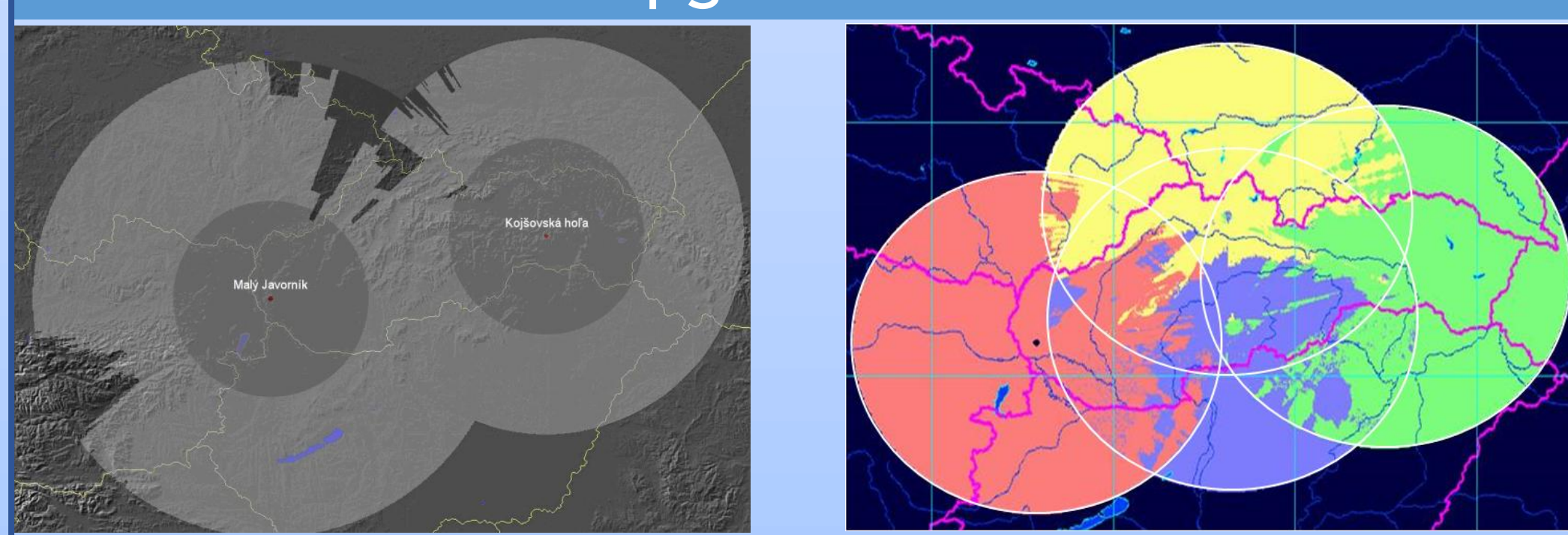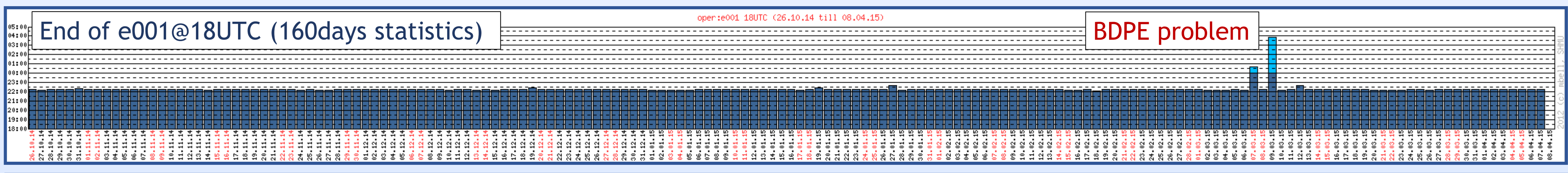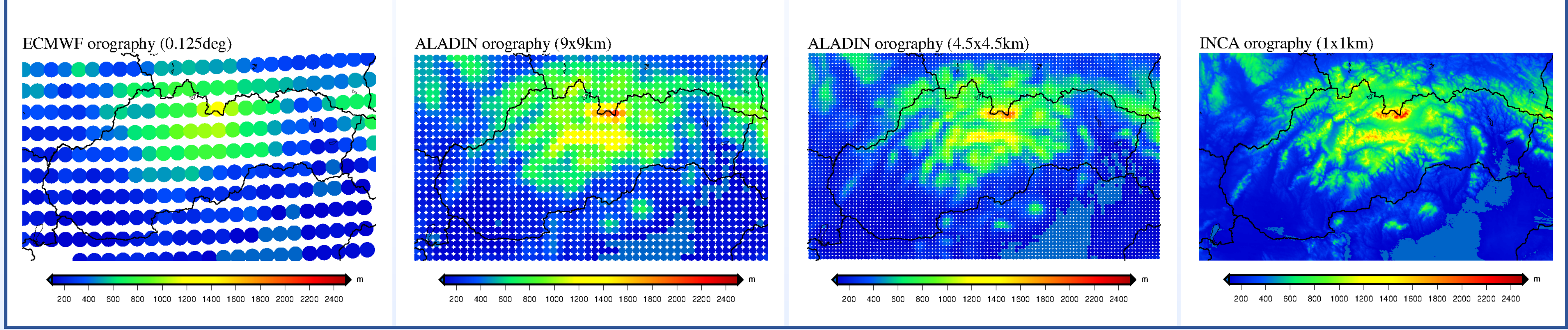

AWS network upgrade:70->137 APS, 32->91 AWS

HARMONIE system Working Week 13-17/10/2014, Bratislava

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Main topics:
- installation of CY38T1.bf03 under HARMONIE (with the emphasis on the "T");
- installation of HARMONIE system including 3DVAR on local platforms, training of newcomers;
- installation of missing ALADIN system components (e.g. DFI blending) under HARMONIE system


Orography: zoom over the domains operationally used @SHMU

ECMWF orography (0.125deg)   ALADIN orography (9x9km)   ALADIN orography (4.5x4.5km)   INCA orography (1x1km)

End of e001@18UTC (160days statistics)   BDPE problem

Evaluation of the high resolution e-suite

High resolution e-suite scores are neutral to slightly positive compared to operational ones. Deterioration noticed for cloudiness in summer. Subjective evaluation by forecasters mostly neutral. Waiting for HPC upgrade.

---- OPER
---- E-suite

T   MSLP   T   G   CC summer
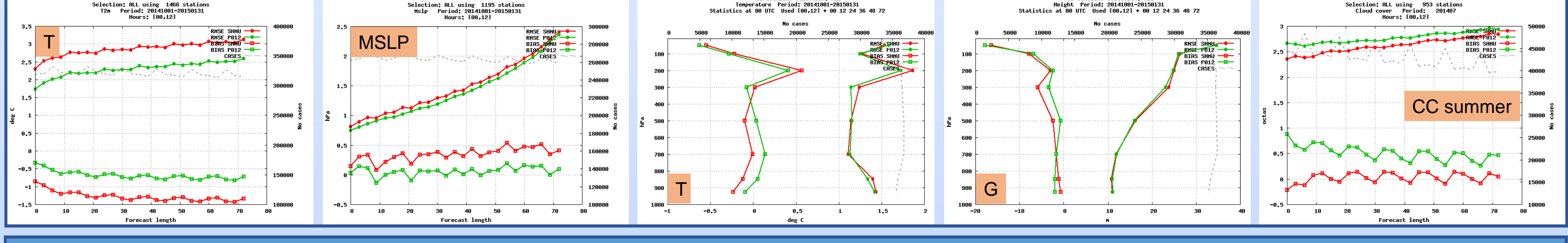
ALARO-1: implemented & first case studies

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ALARO-1 modset ported and implemented. Preliminary case studies focused on cloudiness conducted. Results for Oct2012 presented – fog in Danube valley. : partly improved, but not everywhere (~Bratislava).

OPER   E-SUITE   ALARO-1   MSG
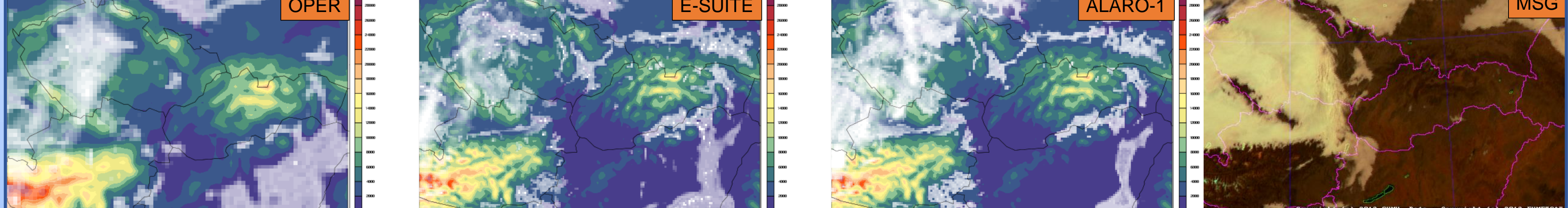
Correction of ALADIN solar radiation fluxes by SAFNWC

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Aladin solar radiation fluxes are corrected according to real clouds as determined by SAFNWC product Cloud Type (CT). Algorithm is being developed and tested on e-suite 4.5km ALARO-0 version:
1) Cloud detection (C(x)) form SAFNWC: hourly averages from 15min outputs
2) Cloud detection from ALADIN forecast
3) Calculation of Damping factor $D(x_i)$ from ALADIN clear sky and solar fluxes over set of points x_i, where clouds were predicted by ALADIN: $D(x_i)= SR(x_i)/CS(x_i)$
4) Dumping factor $D(x)$ over the domain calculated with inverse distance weighting
5) Correction of Solar radiation fluxes with SAFNWC cloudiness $C(x)$:
$SR_c(x) = ((D(x)-1).C(x)+1)*CS(x)$
Plans: extension with medium & high clouds; correction with station measurements

ALADIN solar radiation flux   ALADIN clear sky flux   ALADIN low clouds   SAFNWC low clouds   SRF corrected by SAFNWC
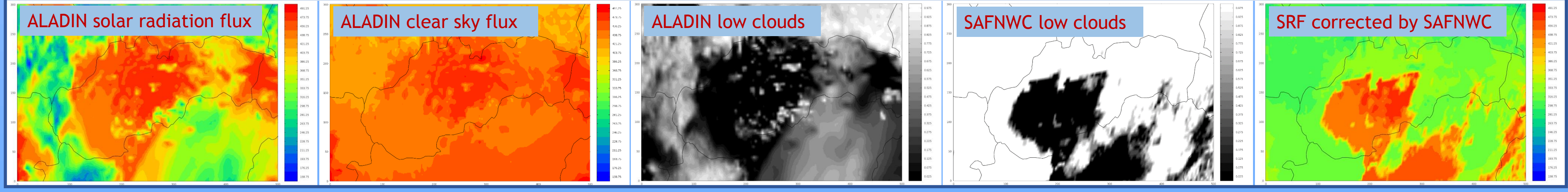
SPPT in ALADIN-LAEF

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Stochastically perturbed physic tendencies (SPPT) for prognostic surface parameters have been implemented in ALADIN-LAEF system, compared to BMP scheme and tuned to simulate the intrinsic model uncertainties. Verification showed bigger spread, less outliers, improvement in ensemble mean BIAS and RMSE. More details to be found in the report available on www.rclace.eu.
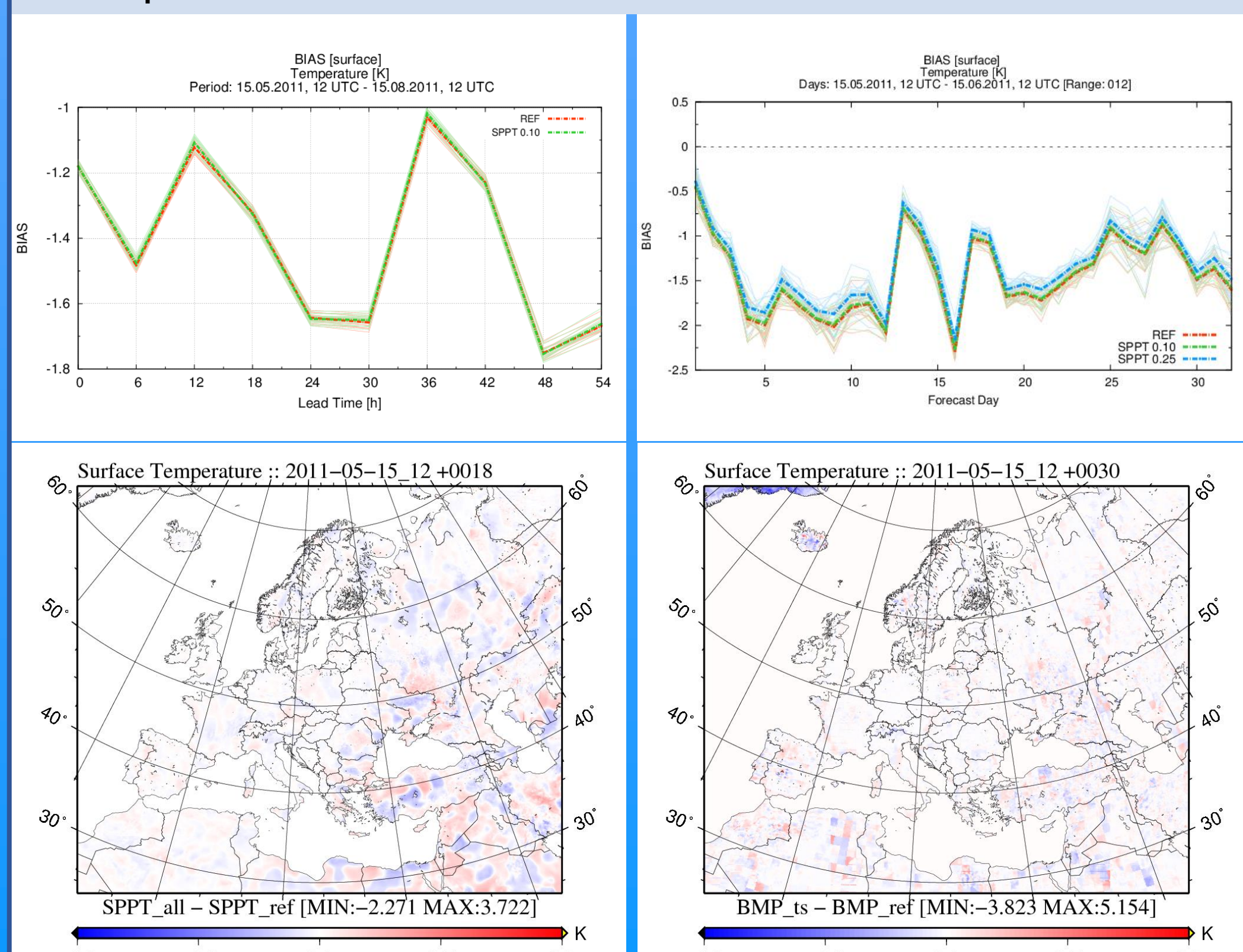
Long-term verification: SHMU NWP index

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Simple Mean Average T=365 days
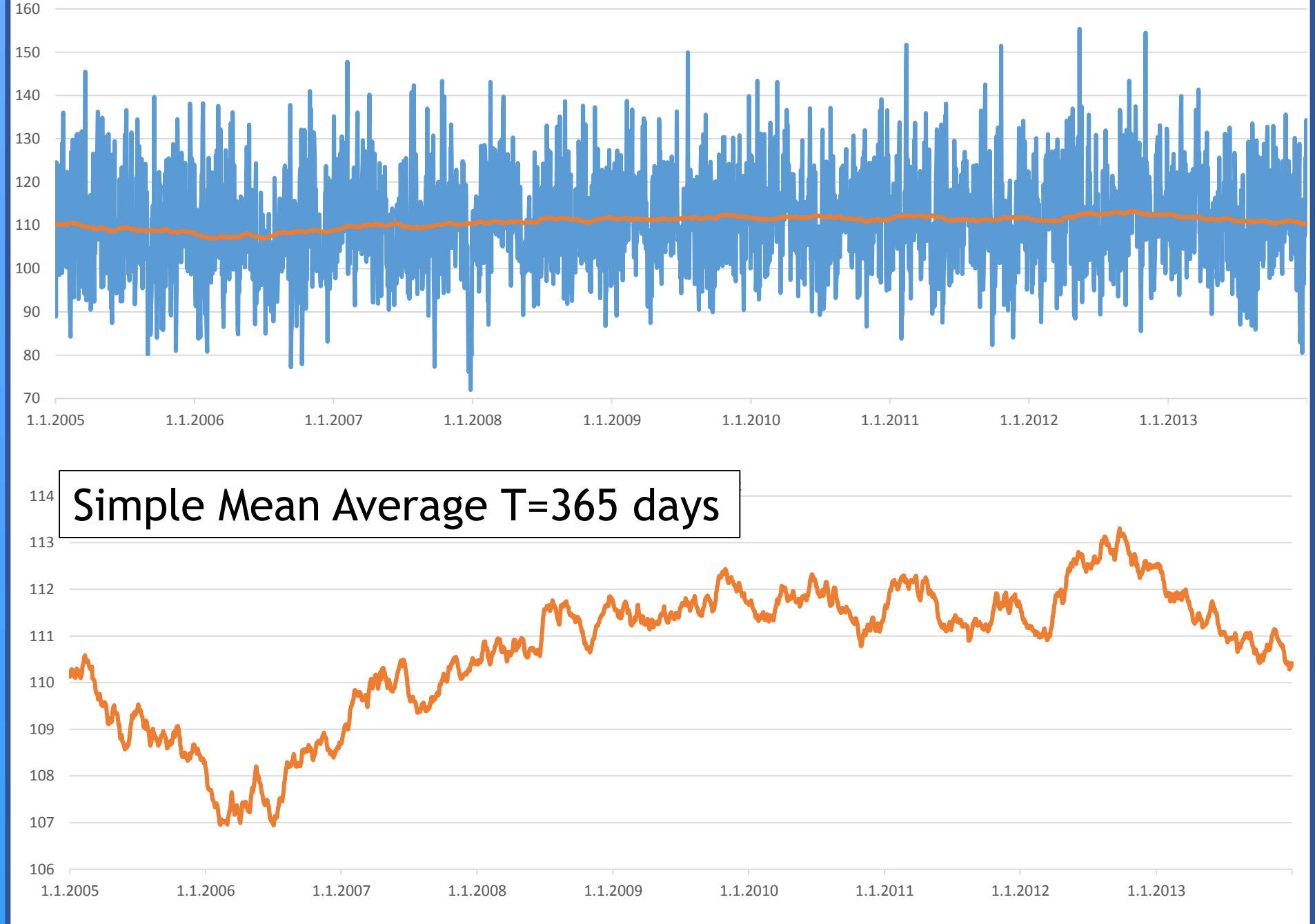
Solar eclipse observations@SHMU 20/03/2015