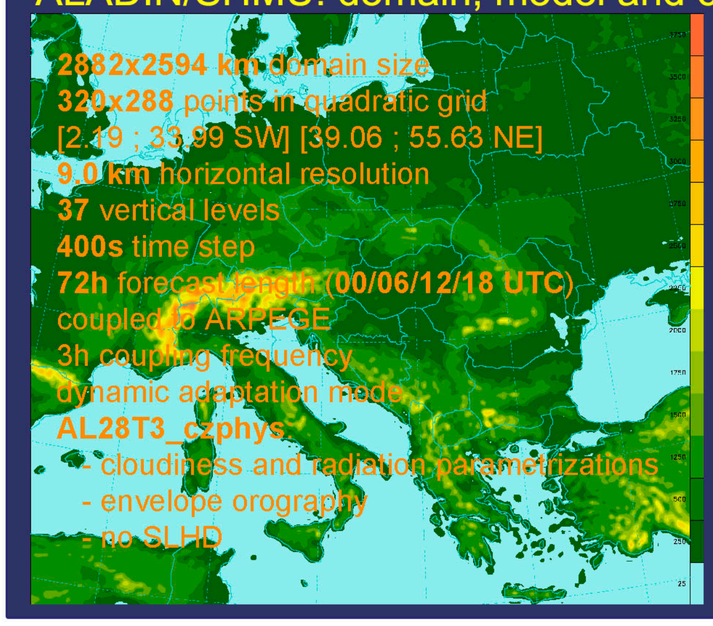
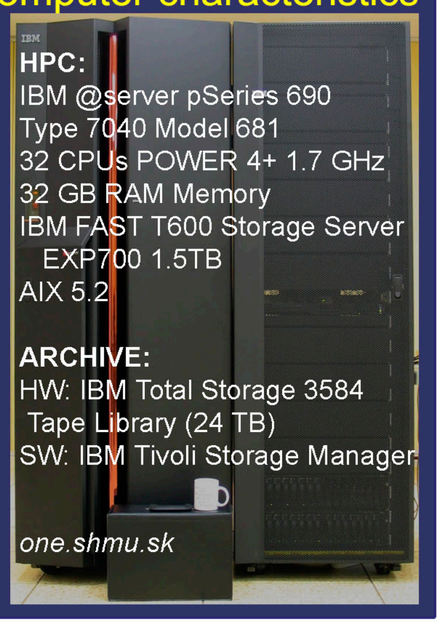
NWP activities at SHMU 2006

28th EWGLAM/13th SRNWP meeting, 9-12/10/2006, Zurich, Switzerland

ALADIN/SHMU: domain, model and computer characteristics



2882x2594 km domain size
320x288 points in quadratic grid
[2.19 ; 33.99 SW] [39.06 ; 55.63 NE]
9.0 km horizontal resolution
37 vertical levels
400s time step
72h forecast length (**00/06/12/18 UTC**)
coupled to ARPEGE
3h coupling frequency
dynamic adaptation mode
AL28T3_czphys
- cloudiness and radiation parametrizations
- envelope orography
- no SLHD



HPC:
IBM @server pSeries 690
Type 7040 Model 681
32 CPUs POWER 4+ 1.7 GHz
32 GB RAM Memory
IBM FAST T600 Storage Server
EXP700 1.5TB
AIX 5.2

ARCHIVE:
HW: IBM Total Storage 3584
Tape Library (24 TB)
SW: IBM Tivoli Storage Manager

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Operational suite monitoring: tools and basic features

- application status browser
- application log files browser
- automatic allerts via e-mail/sms
- application finish time charts

- full application documentation with search engine
- data transfer monitor
- current loading under oper user
- LoadLeveler status monitor
- full remote control via GSM/GPRS device
- read/write/search messages diary

OPERATIONAL SUITE HIGHLIGHTS

23/01/2006: new LBC/CLIM files

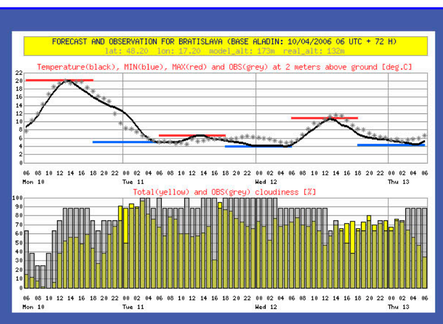
23/03/2006: LBC up to +72 (60) hours

27/03/2006: forecast up to 3days

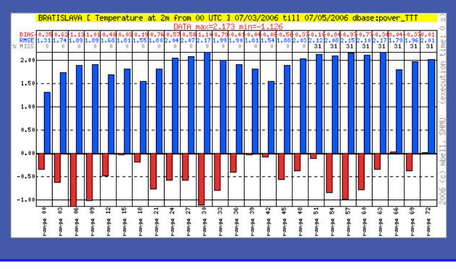
**/06/2006: oper tasks reorganisation (due to ARPEGE rescheduling and upgrade)

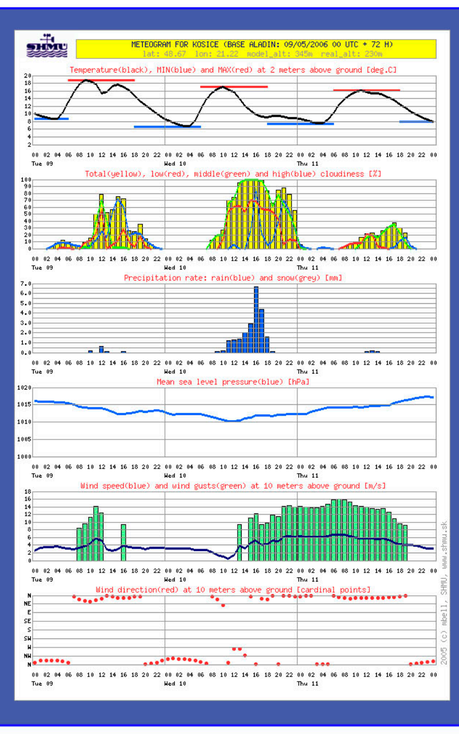
24/07/2006: new LBC backup via ECMWF/ZAMG

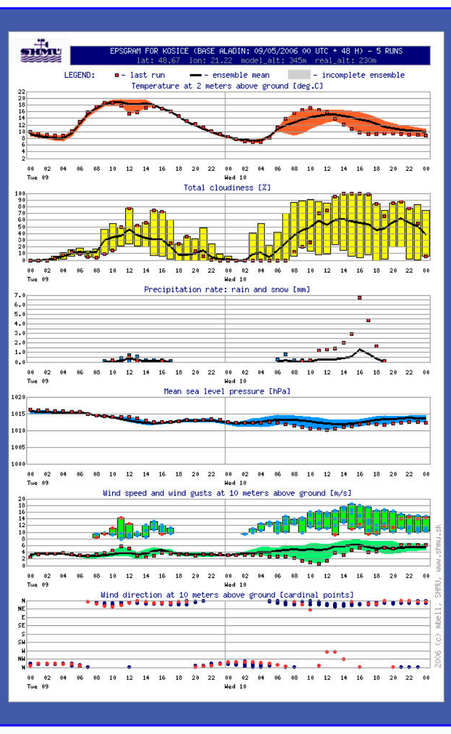
01/08/2006: end of RETIM LBC backup



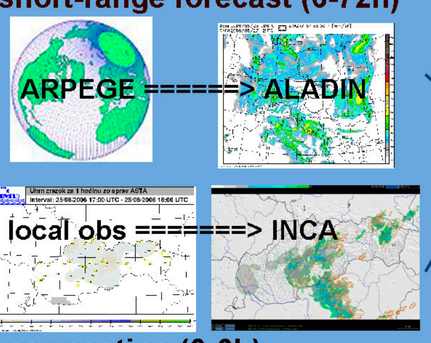
no significant forecast quality degradation for the 3rd day
=> new product:
multirun epsgram for +48h



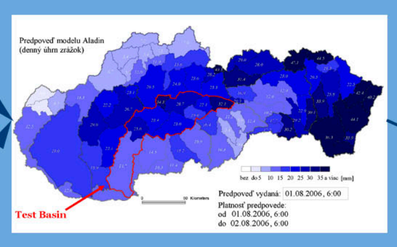


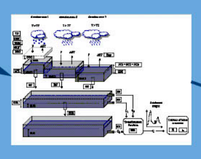


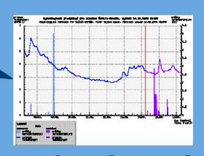
short-range forecast (6-72h)



nowcasting (0-6h)







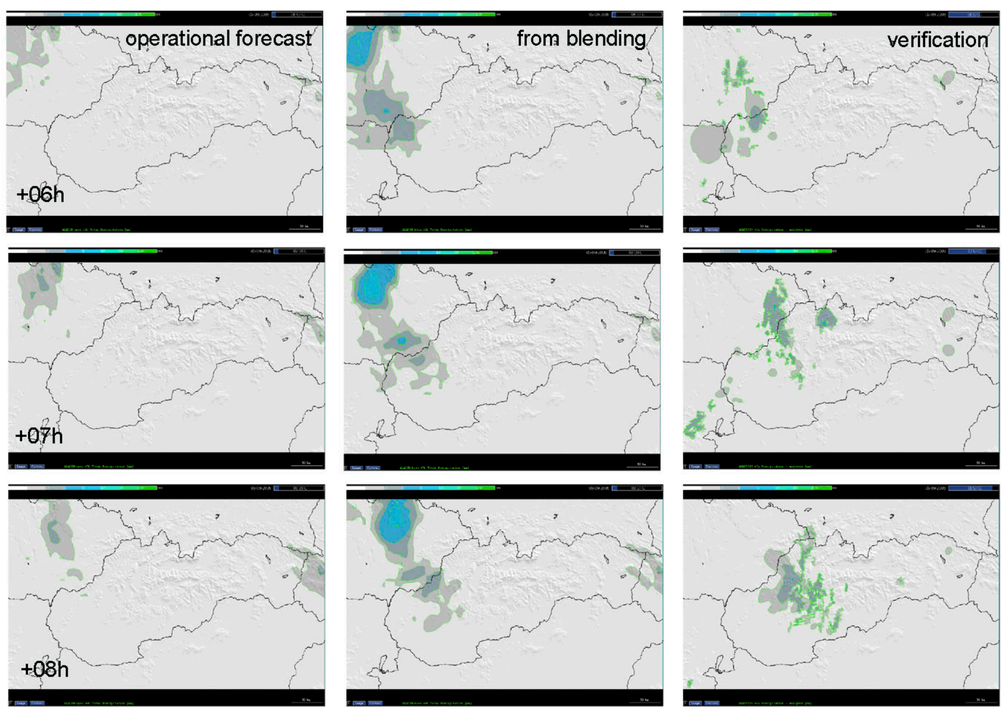
QPF inputs for hydrology ===> rainfall-runoff m. => dissemination of results

FLOODMED:
Monitoring, forecasting and best practices for FLOOD mitigation and prevention in the CADSES region

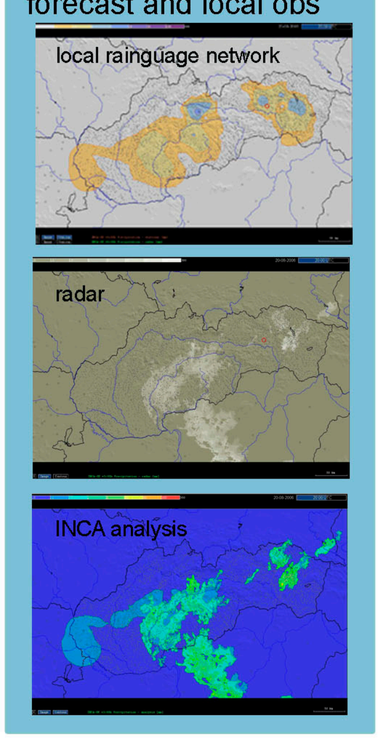
INTERREG IIIB CADSES

Aims at the consolidation of the flood forecasting and warning technological link at SHMU to complete the meteo-hydrological forecasting and warning cascade:
- improvement of ALADIN system (blending by DF, noenvelope orography)
- nowcasting using INCA system

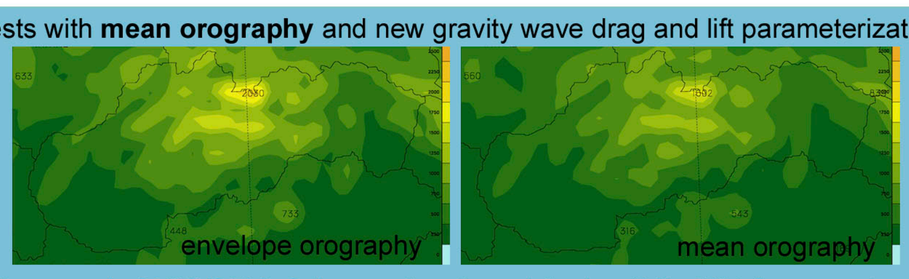
Preliminary results of the **blending by digital filter** technique @ SHMU: better precipitation in the first hours of the forecast. 1h cumulated precip from oper and blending and verification (left to right) for +6, +7, +8h



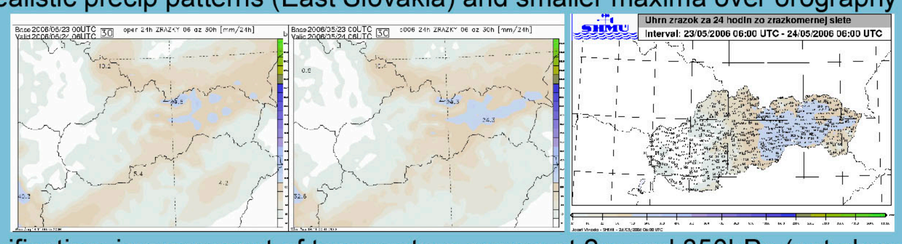
INCA system @ SHMU analysis and nowcasting: combination of ALADIN forecast and local obs



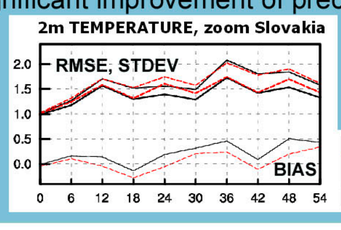
Tests with **mean orography** and new gravity wave drag and lift parameterization

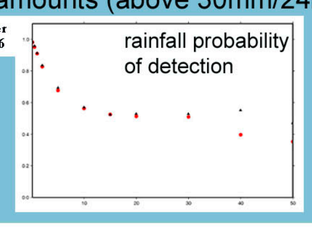


Case study 23/05/2006: 24h cumulated precipitation (06h-30h) for operational run (left) and test (middle), and verification against rainguages (right): more realistic precip patterns (East Slovakia) and smaller maxima over orography

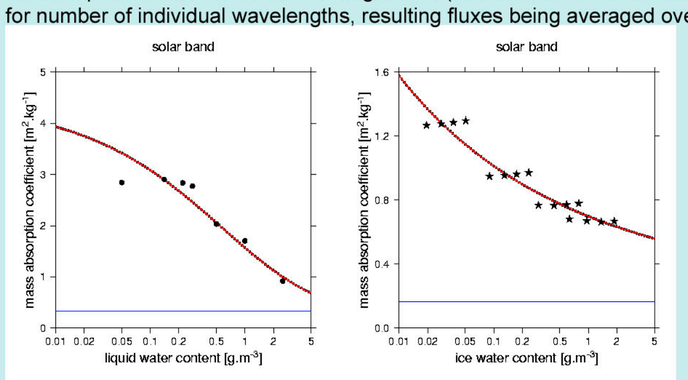


Verification: improvement of temperature scores at 2m and 850hPa (not shown), significant improvement of precip scores for higher amounts (above 30mm/24h)

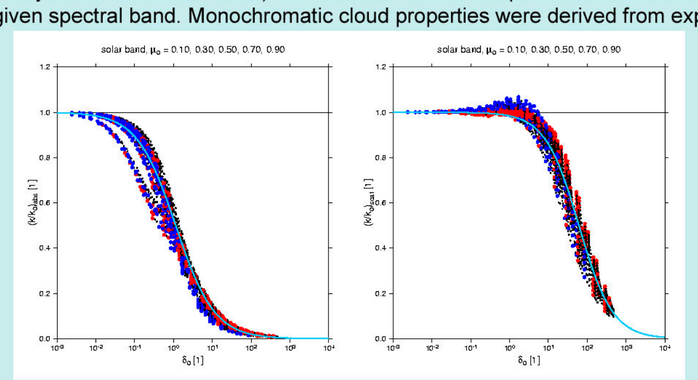




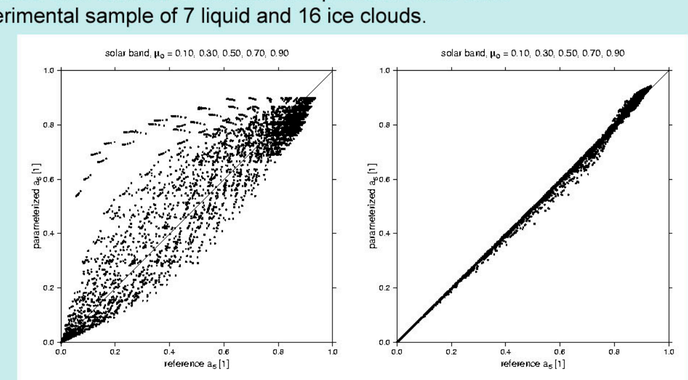
New cloud optical properties scheme for ALARO-0: 1) introduce dependency of absorption and scattering coefficients on cloud water content (current ACRANEB uses constant values) 2) make saturation effect dependent on actual cloud configuration (current ACRANEB assumes only mean saturation effect) New scheme was developed and tuned in idealized environment. Reference computations were done for number of individual wavelengths, resulting fluxes being averaged over given spectral band. Monochromatic cloud properties were derived from experimental sample of 7 liquid and 16 ice clouds.



Dependency of unsaturated absorption coefficient on cloud water content. Black circles/stars - spectrally averaged values for individual liquid/ice cloud types, black dots - fitted and spectrally averaged dependency on lwc/iwc, red curve - Pade approximant of this dependency, blue line - constant value used in current ACRANEB taking into account mean saturation.



Dependency of saturation factors c_abs and c_scat on effective optical depth for sample of homogeneous clouds and several solar zenithal angles. Red circles - liquid clouds, blue circles - ice clouds, black dots - mixed clouds, blue line - fitted dependency.



Parameterized versus reference solar plane albedo computed in idealized framework for sample of homogenous clouds and several solar zenithal angles. Left - old scheme (current ACRANEB), right - new scheme.

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