

Progress on the convergence paper ALADIN/HIRLAM

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The « convergence paper » : background

- Sofia meeting (may 2006) : HMG and CSSI jointly asked for position paper on surface collaboration issues, including scientific and algorithmic issues.
- People involved : *François Bouyssel, Stefan Göllvik, Gwenaëlle Hello, Luksa Kraljevic, Patrick Le Moigne, Eric Martin, Valery Masson, Sander Tijm, Piet Termonia*
- Aim :
 - Present the current status of HIRLAM and SURFEX
 - Propose contact and strategy for convergence on surface issue
 - Describe algorithmics and interfacing issues

The « convergence paper » : status

- Paper in progress :
 - Comparison of the surface codes, by topic
 - Algorithmics/interfacing : list of variable exchanged
 - Selection of references
- To be done
 - Scientific cooperation on parametrisation and assimilation
 - Technical issues (exchange of code)
 - Algorithmic (interfaces, ...)

Comparison of SURFEX and HIRLAM surface

	ALADIN / SURFEX	HIRLAM
Sea	Charnock formula, uniFTP, Mondon and redelperger fluxes prescribed temperature	Tile « water » and « ice on water » Plan to use FLAKE model
Lake	Charnock formula, prescribed temperature	Plan to use snow model on ice
Soil/vegetation	Tile « nature », Variable number of patches, (max 12), depending on user choice and physiography	High vegetation tile Low vegetation tile
town	TEB	Tests by Baklanov et al., 2006
snow	TEB 1 layer scheme on roof and road Nature : <ul style="list-style-type: none"> ▪ 2 one-layer lumped snow model ▪ 1 three-layer scheme, with separate surface budget 	3 types of snow : <ul style="list-style-type: none"> ▪ Snow on Low vegetation ▪ Snow on High vegetation ▪ Snow on ice

Comparison of SURFEX and HIRLAM surface

	ALADIN / SURFEX	HIRLAM
Orography	SURFEX orography may (slightly) differ from the rest of the model Subgrid orography calculated by SURFEX	One orography and subgrid orography
Physiography	GTOPO30, ECOCLIMAP	GTOPO30, GLCC
Set up /IO	SURFEX uses several format (ascii, grib, fa, lfi, Netcdf)	Surface setup in the general model setup, no specific IO, except specific surface namelists
Diagnostics	SURFEX diag	In the surface scheme

Comparison of SURFEX and HIRLAM surface

	ALADIN / SURFEX	HIRLAM
General	SURFEX not used in assimilation mode Plans to develop a surface assimilation, based on the current ARPEGE scheme and pas and on-going research. On going tests on ALADIN	Surface analysis sheme in use
Algorithms for soil/vegetation	Optimal interpolation, modification of soil T and water content to improve 2m scores. Research on variational, dynamical optimal interpolation, ...	
SST/sea ice	Optimal interpolation, with relaxation to NESDIS SST. Test with SST satellite observatin in ALADIN. Sea ice from SSMI	Successive correction, ECMWF 0.5°C as background. Plan to use OSI SAF in the near future.
Snow	Relaxation toward a climatology, snow melting applied, depending on the analysed 2m T	
Lake	/	

Exchanges of variables between Atmosphere and surface in run mode

- SurfEx follows the Best et al., 2004 Interface :
 - Input : meteorological variables
 - Coefficients for implicit coupling if necessary
 - Output : aggregated fluxes
 - Inquiry mode (call to the surface to get some variables, e.g. albedo)
- HIRLAM surface
 - Input : meteorological variables
 - Output : aggregated fluxes
 - Inquiry mode (call to the surface to get some variables, e.g. albedo)
 - Other exchange of variables (stored in the general model, not inside the surface part).

Conclusion

- The « easy » part of the paper is written

- To be done during the workshop
 - Scientific cooperation on parametrisation and assimilation
 - Intercomparison, exchanges of schemes, development of common new schemes,...
 - Technical issues and algorithmic (interfaces, exchanges of codes...)
 - Externalisation including setup of HIRLAM surface ? How to extract one scheme from one model and use it in the other model ?
 - ...

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