Remarks on HIRLAM physics overhaul

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Contents


From ASM 2005

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- Existing simple and optimized schemes, like radiation
- Scale-dependent solutions like in STRACO, SSO/MSO, sloping surface radiation
- Work with new simple schemes, like Schultz microphysics
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- Code to obey the common interface rules and IFS standards
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Tools and definitions for cleaning work

- Cleaning questions to analyse the code
- Interface rules prepared in cooperation with ALADIN people
- IFS structures and conventions

$\Rightarrow$ Plan and tasks for the physics overhaul

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- We accept IFS as the framework for further developments in physics
- We know that each group in HIRLAM-ALADIN cooperation aimed towards AROME is responsible for making its own code compatible with IFS standards


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- MF physics interface for HIRLAM (SMHI)
- ECMWF physics interface for HIRLAM (KNMI)
- importing IFS-formatted components: ISBA, MSO, Tiedtke mass flux

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Recent HIRLAM recoding

- modification of dynamics - physics coupling (Isabel Martinez)
- recoding of climate and surface arrays (Han The)
- analysis and recoding of HIRLAM when creating MLAM (Janne Kauhanen)


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- how deep cleaning do we need?
- full IFS-F90 restructuring or first cleaning based on old F77?
- start from top (PHCALL) and bottom (subroutines) simultaneously
- definition of (new) variables and arrays, length of parameter lists?
- are the constants and common variables defined
  at optimal level only once ?
- schemes and processes, allowed combinations and options?
- are there known and hidden scale dependencies in physics?
- what are the specific problems of the externalized surface block?
- requirements for output of the whole physics:
  for model dynamics, users, diagnostics ...
- do we still need fractional time stepping in phys?
- do we still need PHTASK parallelisation?
- do we still need the old structures to avoid dynamic memory allocation?
- is the misuse of GRIB standards (by ISBA) a problem?
- how does the physics cleaning relate to the HIRLAM integration project? ...

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PHYS

define levels etc

- call AHYBRID

radiation

- call CLOUD at first time step only
- call SURF2RAD
- call ARADIA
- call RAD2SURF

surface

- call AISBAH4 (several subroutines inside)
- call APBLHGT

turbulence

- call AVCBR

(• call AVDIFNL)

note: fractional time stepping inside surface + turbulence!

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(SSO - MSO)

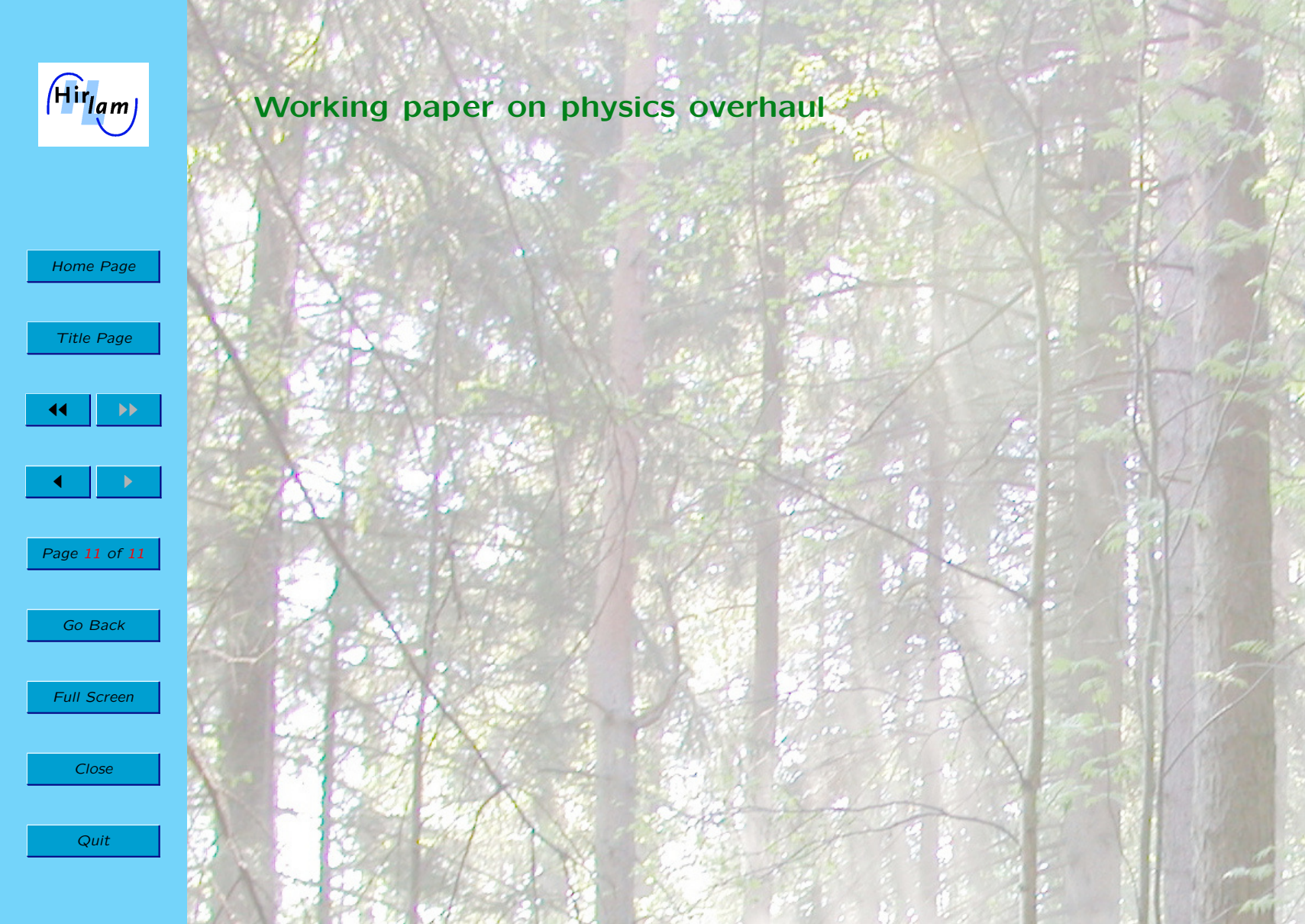
(• call OROTUR)

(• call BVFREQ)

(• call AMFDRAG (several subroutines inside))

clouds:

- call AKFRAK (several subroutines inside)
- (call ACONDENS)
- call ADIAGCND
- call ACONDS (several subroutines inside)
- call CLOUD2D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5. Cleaning questions for the analysis of the present code
6. Practical tasks and time schedule