



HIRLAM Reference System

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Outline

This talk lists some headlines on:

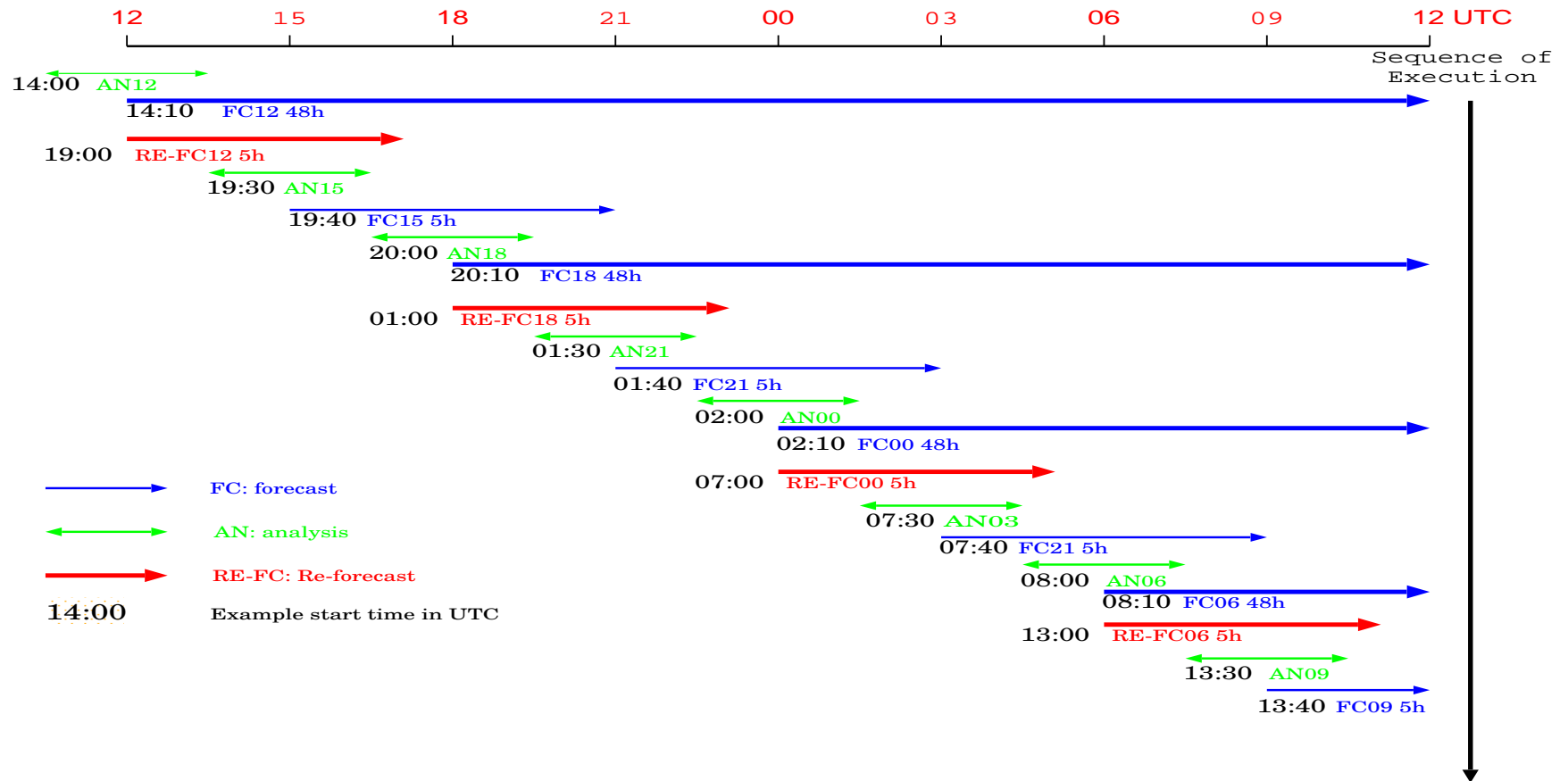
- Hirlam 7.0
- Hirlam 7.1
- Hirlam 7.2
- Harmonie 31h1



Main features of Hirlam 7.0 (May 2 2007)

- Re-forecast cycling
- ATOVS AMSU-A (NOAA-15, NOAA-16)
- Removal of revision control features from scripts
- Improved diagnoses for PMSL and H; pseudo satellite imagies

Hirlam 7.0: Re-forecast in DA cycling



Example of the operational HIRLAM schedule using reference system 7.0



Hirlam 7.0: Assimilation of ATOVS AMSU-A data

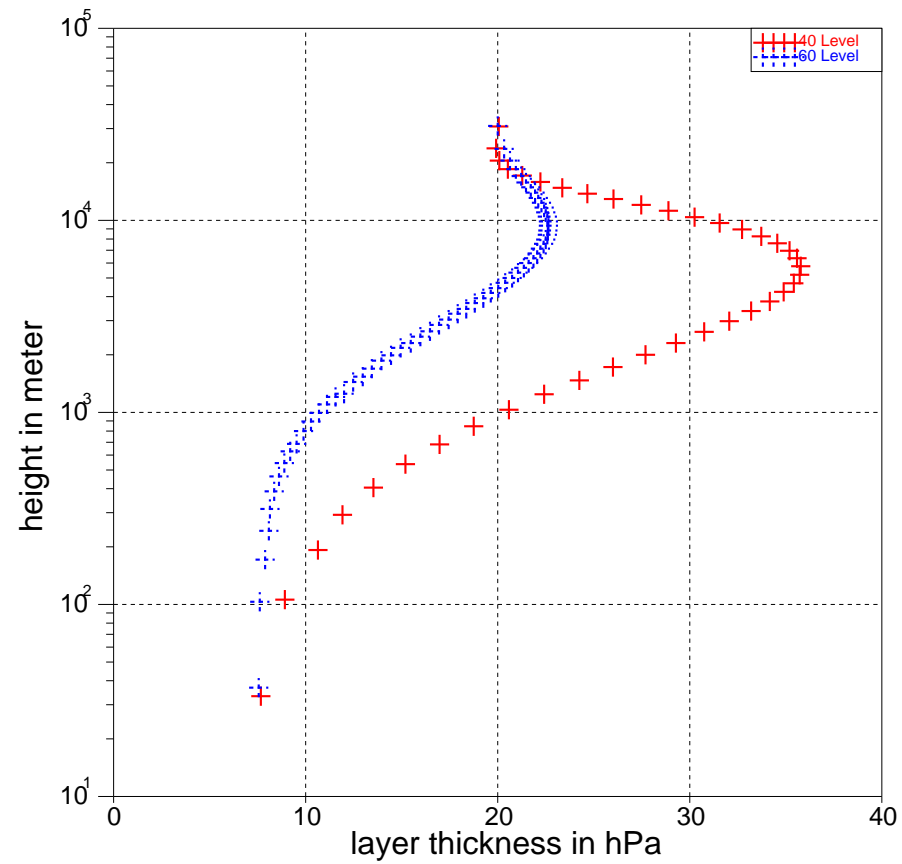
- bias correction derived from RCR archive from 2005
- local monitoring and derivation desirable



Highlights of Hirlam 7.1 (March 28 2007)

- Resolution increase (0.15 d, 60 level)
- 6 h cycling with statistical-balance structure function
- F90 physics including moist CBR and STRACO tuning
- Extended direct model output lists
- Correction on initialisation

Hirlam 7.1: Vertical resolution upgrade



Hirlam 7.1: Physics update

- Moist CBR
- STRACO update
 - target on improvement for extreme (dry and heavy rain) cases and RH
 - addition of cloud ice parameterisation (NSVAR=2, IPAR=58)
 - reversed order of resolvable and sub-grid scale condensation computation
- F90 physics (moist CBR, STRACO and radiation)
- Soil freezing correction

Hirlam 7.1: Data assimilation

- statistical balance structure function with data from RCR runs
 - 60-level data derived by boot-stripe method
 - 40-level data from FMI-RCR archive
- 6 h cycling replacing 3h cycling
- changes in minimisation
 - full resolution minimisation for RCR (!! more costly)
 - conjugate gradient algorithm



Hirlam 7.1: Extended Post-processing

- visibility
- gust wind
- CAPE index
- precipitation category
- LCL height
- maximum and minimum T2m, W10m

Hirlam 7.1: Technical improvement



- model top wind maxima correction (McDonald)
- climate generation cleaning (data holes etc.)
- reduced archiving at ECMWF (interpolated LBC data; model level data)
- verification graphics package
- harmonisation of naming convention between forecast and DA codes
- script cleaning and improvement
- extended output stream options
- extended climate fields for MSO-SSO (use MSO_PAR=no to avoid)
- extended model domain options

Hirlam 7.1: Non-default development options



- 4DVAR with Jc
- Assimilation of AMV wind
- Assimilation of RH2M
- NOUA option
- LBC with ECMWF BC suite
- Ensemble forecast generation set-up
- SETTLS advection scheme
- 6th order implicit diffusion scheme

Highlights of EPS mode in HIRLAM 7.1

The scripts for ensemble forecast features

- a switch for deterministic and ensemble runs (i 999)
- preparation of online ECMWF-EPS LBC
- analysis in control run
- ensemble member specific environment settings (e.g., physics options)

No post-processing packages included yet

Highlights of Hirlam 7.2 (second half of 2007)

- 4DVAR with Jc
- New surface scheme
- KF-RK or STRACO
- MSO-SSO parametrisation
- Assimilation of OSI-SAF SST-ICE
- System overhaul
- Reference verification upgrade

Hirlam 7.2 components: data assimilation

- 4DVAR with Jc, Jlb, Jk
- Assimilation of OSI-SAF SST-ICE
- OBSPROC upgrade (domain check,etc.)
- RTTOV8 and AMSU-A assimilation upgrade
- Assimilation of NOAA 18, METOP
- New moist control parameter
- Assimilation of scatterometer data

Hirlam 7.2 components: physics

- New surface scheme
- KF-RK scheme or STRACO?
- MSO-SSO
- Orographic radiation



Hirlam 7.2 components: system aspects

- System overhaul (code, script, build)
- Open-MP option
- MARS filter for direct archiving to MARS at ECMWF
- GRIB API
- verification package upgrade



Hirlam 7.2 components: EPS option

- EPS analysis perturbation option
- EPS post-processing and verification package

Highlights of Harmonie 31h1 (May 2007)

- source code based on updates to IFS/ALADIN cycle 31
- reference platform defined on ECMWF HPCE
- HIRLAM's run-scripts and utilities included
 - run-scripts cover 1) prepare, 2)run and 3)post-processing steps
 - build/compile separated from run scripts
 - HIRLAM-equivalent SMS or mini-SMS yet to be implemented
 - utilities for monitoring, file conversion, verification and graphics
- sample setup for nested forecasts with h/nh-ALADIN, AROME/hirlam physics