HARP
recent developments & current status

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ALARO working days, 12-14 September 2016, Brussels

- Introduction: what is HARP
- Current status of HARP
- Rfa and friends
- Conclusion

What is HARP

- **H**irlam/**A**ladin **R** **P**ackages
- Verification suite with two main modules:
  1) EPS verification
  2) Spatial verification
- R-based
- Modular
- Web-based gui for visualisation (based on R package *shiny*)

SQLite

- R
  - Open source software for statistics, visualisation…
  - A working environment
  - Also scritpable (Rscript)
- SQLite
  - Very common SQL database
  - File based (no server)
  - Very portable (both the data and the code)
- Shiny
  - R package for building interactive web interfaces

HARP-EPS

1) Tools to extract point data from an EPS data set (in GRIB) and store them in SQLite data base files.

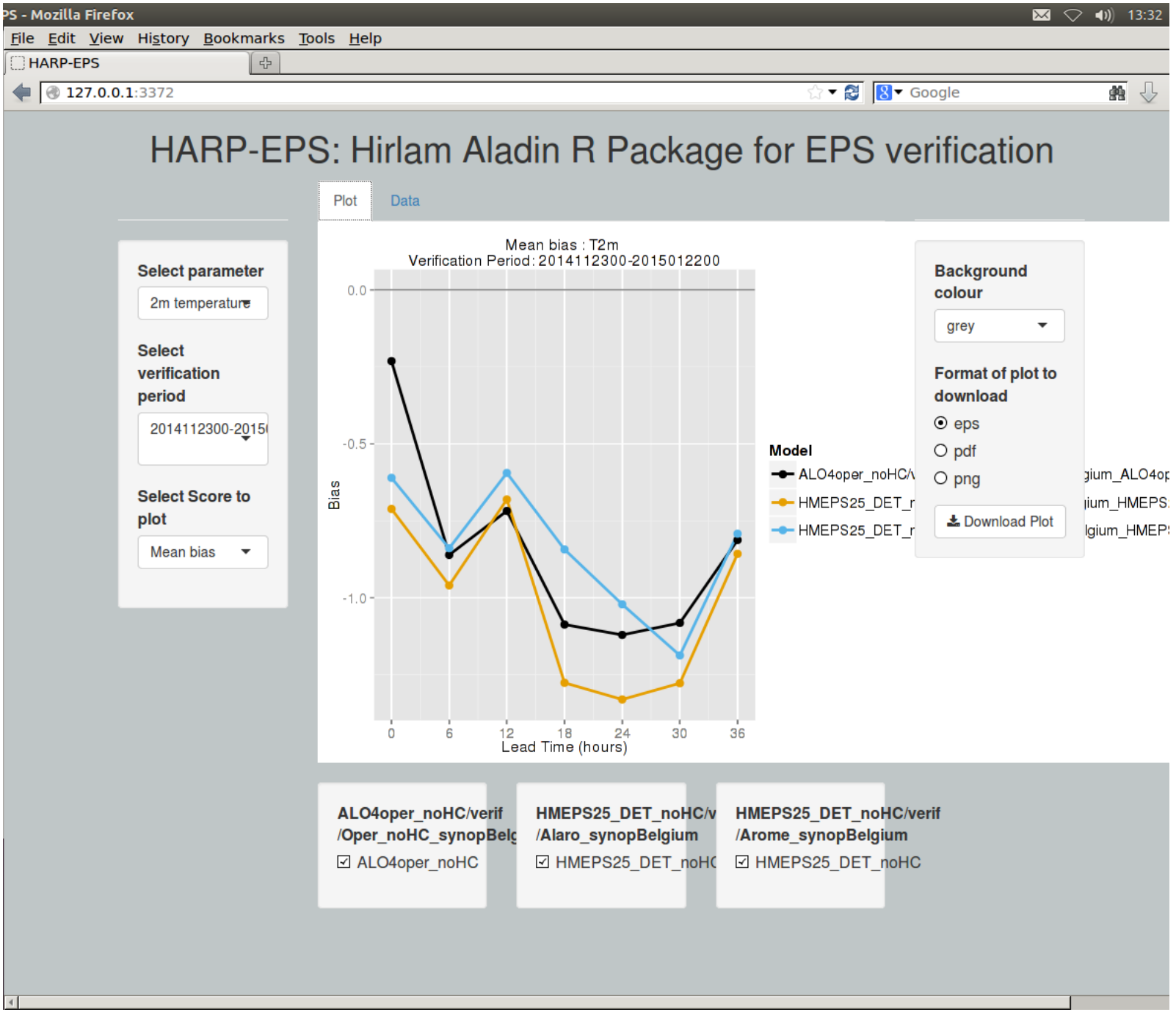
2) Main verification uses these SQLite input files and writes a selection of EPS scores to a new SQLite file. Runs offline.

3) 'Shiny' web interface for interactive graphical representation of the scores.

HARP-EPS

- v1 was released, continuous improvements and fixes.
- Extensive documentation available
- Most recent developments: improved installation routine, update R packages, many fixes.
- Development has slowed down recently.

Example

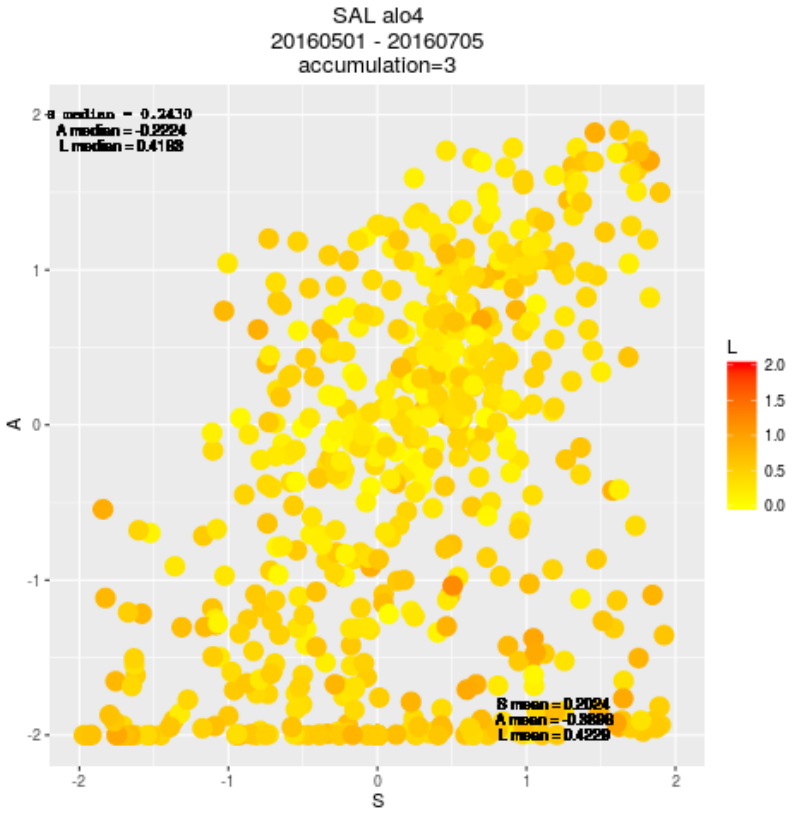

PS - Mozilla Firefox
13:32
File Edit View History Bookmarks Tools Help
HARP-EPS
127.0.0.1:3372
Google
HARP-EPS: Hirlam Aladin R Package for EPS verification
Plot
Data
Select parameter
2m temperature
Select verification period
2014112300-2015
Select Score to plot
Mean bias
Mean bias : T2m
Verification Period: 2014112300-2015012200
Bias
0.0
-0.5
-1.0
0
6
12
18
24
30
36
Lead Time (hours)
Model
ALO4oper_noHC/
HMEPS25_DET_
HMEPS25_DET_
Background colour
grey
Format of plot to download
eps
pdf
png
Download Plot
ALO4oper_noHC/verif
/Oper_noHC_synopBelg
ALO4oper_noHC
HMEPS25_DET_noHC/v
/Alaro_synopBelgium
HMEPS25_DET_noHC
HMEPS25_DET_noHC/verif
/Arome_synopBelgium
HMEPS25_DET_noHC

Status

- HARP-EPS is functioning and is already being used. Many rough edges…
- HARP-SPATIAL is delayed for various reasons. A lot of code is already in place (SAL, FSS...), but not yet unified.
- Example SAL precipitation verification
    1) Read model (FA) and Radar (hdf5) files
    2) Interpolate to common grid, calculate SAL
    3) Store in SQLite database
    4) Visualisation using 'shiny'

Example: SAL SQLite table

fcdate	fcrange	accum	model	S	A	L
20160501	6	3	Alo-4km			
…	…	…	…	…	…	…



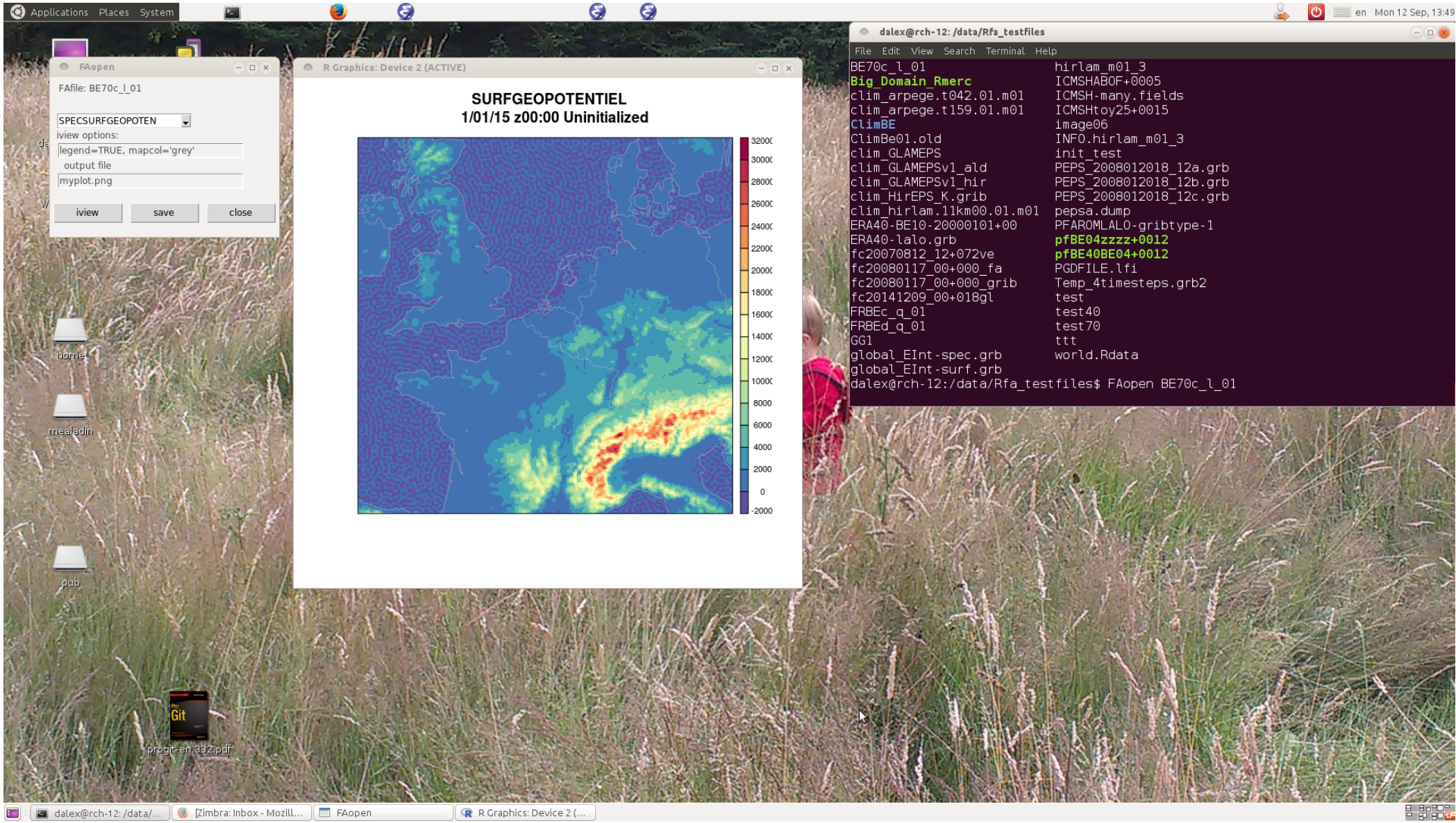
Rfa and friends

- FA and GRIB decoding/encoding and visualisation in R.
- In development since almost 15 years, but still evolving. Major changes in the past year.
- Decoding of HDF5
- Various new and improved options for *grid interpolation* (bilinear, bi-quadratic, wind vectors ...) and *upscaling.*

Rfa 4.1 (in beta)

- An R package for analysis, visualisation and encoding of FA files.
- Version 4: FA code recoded from scratch in R and C
- Various ALADIN/ALARO file formats supported:
  - FA
  - LFI (surfex)
  - Echkevo
- Vertical profiles, 2D sections
- Direct access to FA files inside tar archives
- Data encoding and file manipulation
- Easy coding of *command line tools* using Rscript.

Rfa command line tools



```
#!/usr/bin/env Rscript
usage <- "USAGE: iview filename field"

# get command line arguments (only the relevant ones)
carg <- commandArgs(trailingOnly=TRUE)
if (length(carg) < 2) stop(usage)

# a very simple interface:
fafile <- carg[1]
ff <- carg[2]

# load libraries as silently as possible
#suppressPackageStartupMessages(library(Rfa, quietly=TRUE))
suppressWarnings(suppressMessages(library(Rfa, quietly=TRUE)))

# open graphical window
X11()

# make the actual plot
iview(FAdec(fafile,ff), legend=TRUE)

# now wait for the window to close
while (!is.null(dev.list())) Sys.sleep(1)
```

TO DO

- Make most recent HARP source code more accessible. (main git repository is hosted by HIRLAM, source code is available on e.g. ecgate)
- HARP-eps:
  - Quality control of observations
- HARP-spatial:
  - More general decoding of HDF5 data
  - Finish implementation of basic scores (SAL, FSS...)
  - Make the configuration and installation more similar to HARP-eps.
  - Documentation