

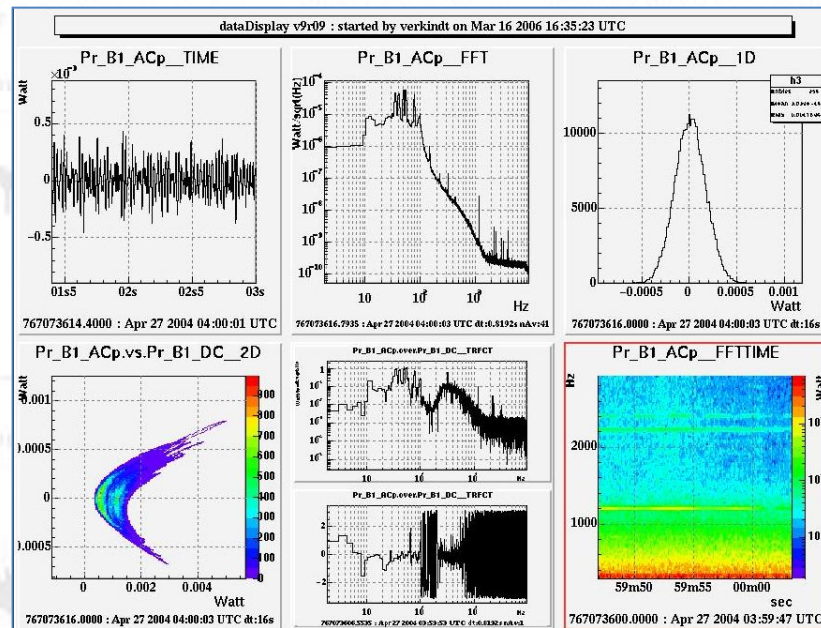


# *dataDisplay evolution*

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Show the current status (not exhaustive) and the evolution prospects (to be discussed) for the following dataDisplay parts:

- Data read/write (online and offline)
- Data processing
- Display with ROOT
- GUI
- Main engine





# Data Read/Write



## Current status

- Read offline frames from files on disk or from a dataSender
- Read online through Cm connection or through shared memory
- Write frames containing the channels read to produce the plots
- Read/write wav audio files

## Foreseen evolution

- Improvements on dataSender
- Add possibility to read several files in parallel (raw, trend, h...)
- keep using Cm or shared memory connections but add an online dataSender
- Maybe provide connection with DQ segments



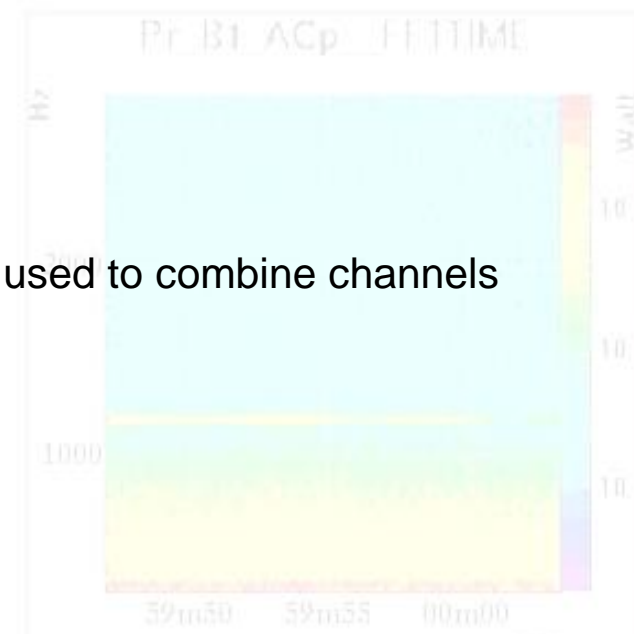
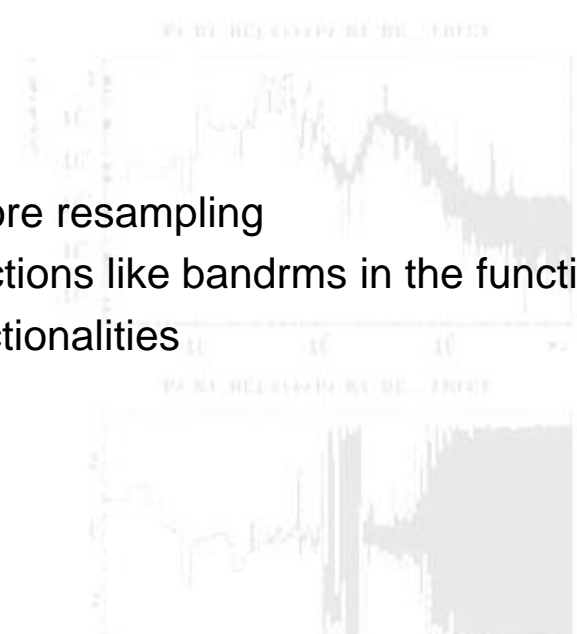
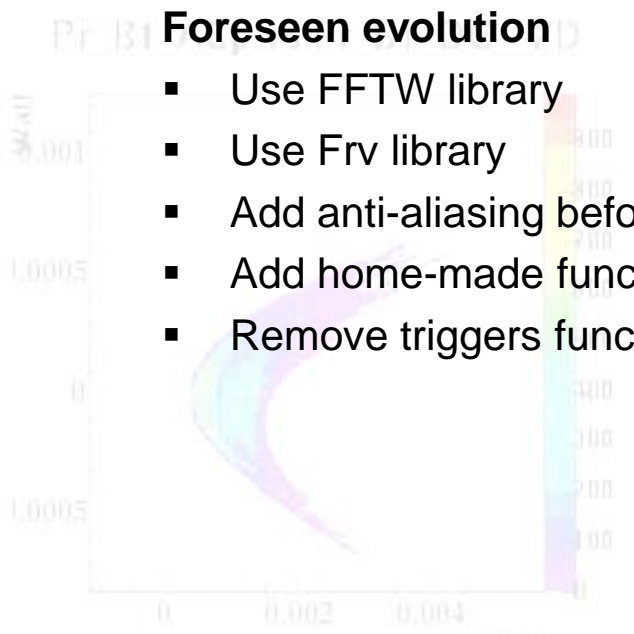
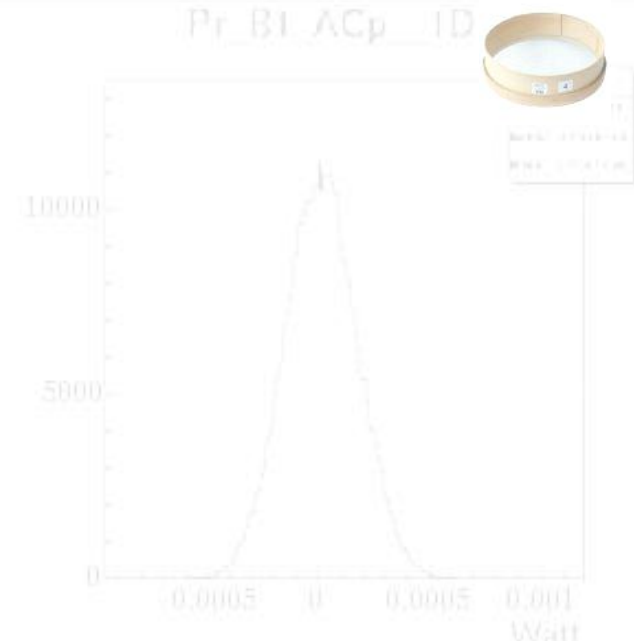
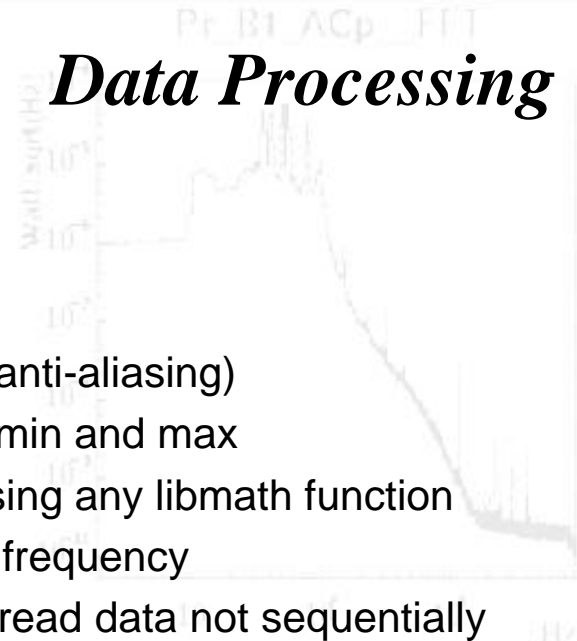
# Data Processing

## Current status

- Use Cernlib FFT
- Resampling (without anti-aliasing)
- Resampling keeping min and max
- Combine channels using any libmath function
- Compute rms versus frequency
- Use list of triggers to read data not sequentially

## Foreseen evolution

- Use FFTW library
- Use Frv library
- Add anti-aliasing before resampling
- Add home-made functions like bandrms in the function used to combine channels
- Remove triggers functionalities





# Display with ROOT



## Current status

- Use ROOT libraries for doing the plots
- Provide various features (Zoom All X, Zoom All Legends, superpose, etc...)
- Save/Manage/Superpose reference plots
- Show color bands for missing or corrupted data
- Etc...

## Foreseen evolution

- Increase speed by using Paint instead of Draw for plots refresh
- Have a data buffer for each plot and provide Zooming/Unzooming and axis cursors on the data of each plot (similar to “audacity” audio software)
- Better manage superposition of plots
- Add glitchgrams plots (similar to Omega plots)
- Add grey color bands for unlock periods
- Etc...



# Graphic User Interface

## Current status

- Use Xforms library
- Provide list of channels, list of plots
- Provide a main interface and various sub-panels
- Show color bands for missing or corrupted data
- Etc...

## Foreseen evolution

- Compartment the calls to Xforms functions
- Simplify the main and sub-panels (for instance only one browser for all channels)
- Interface with channels database
- Maybe use of pyROOT



# Main engine



## Current status

- Use a Siesta-like engine based on software clocks whose frequency need to be submultiples of the fastest one.
- Use a Siesta-like configuration file
- Calls to Xforms, ROOT and “siesta” functions are mixed
- Some signal processing are mixed with plots functionalities

## Foreseen evolution

- Replace Siesta-like engine by FdIO-like engine, with only reference to GPS time
- Use a home-made configuration based on strings (but keep compatibility with old siesta-like configurations)
- Compartment as much as possible the calls to Xforms functions and to ROOT functions.
- Separate signal processing from plots management



# Summary



## Current status

- A 10 years old tool regularly improved and maintained
- A commissioning and data analysis tool much tested because largely used
- Use “only” Xforms, ROOT, Fr, Cm, CSet libraries
- But missing useful features and has accumulated user comments and bug reports

## Foreseen evolution

- Will use also Frv (thus FFTW) library
- Lots of improvements foreseen but not yet frozen (*a VDAS-DAQ meeting will be organized around ideas for dataDisplay evolution*)
- A large modification of the main engine that will require 2 or 3 months of work
- On a longer term: various options on the table that may need coordination and maybe EGO resources
  - Use of pyROOT
  - Online: use Cm or shared memory → use also Ethernet socket or NDS2...