The TID software package

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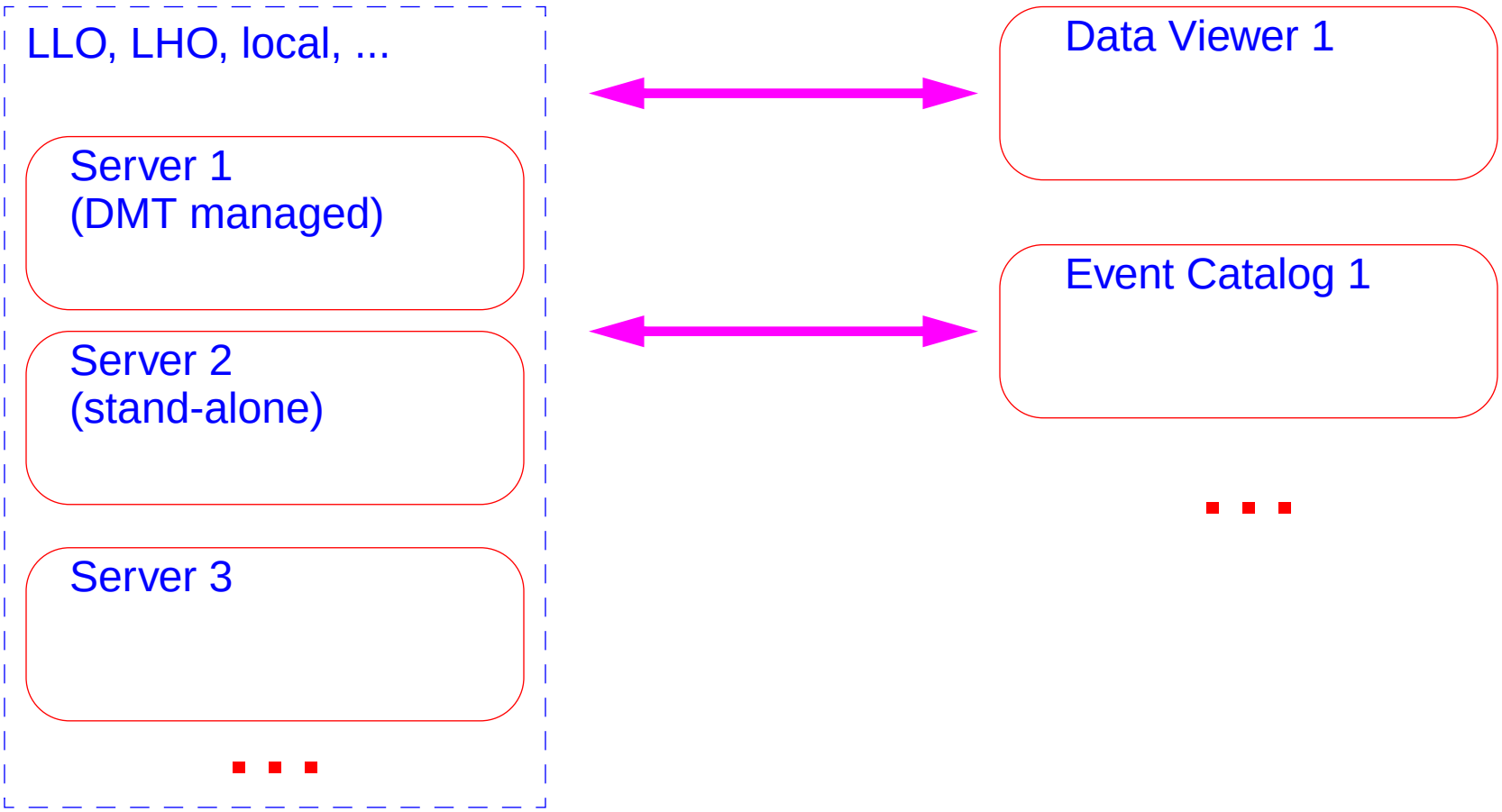
Features

- Time-frequency detection of transients with clustering analysis and power thresholds
- Real-time, configurable data viewer
- Pattern classification, trigger generation

Architecture



Server

- time-frequency representation from short-time Fourier transforms
- At every frequency, noise power modeled by Rice distribution (allow lines and colored Gaussian noise)
- Chi-square test over long timescale (e.g. 5 minutes) to check validity of fit to steady-state noise
- Three stages in analysis:
  - threshold on power to generate black pixels
  - clustering analysis to eliminate small groups of pixels
  - threshold on power integrated over clusters
- Can do ~20 2 kHz channels / CPU (depends on bpp)

Data Viewer

- Display data from available channels on any number of servers
- Configurable, zooms in time and frequency, postscript dumps
- Export event measures: times, bandwidth, power, etc.

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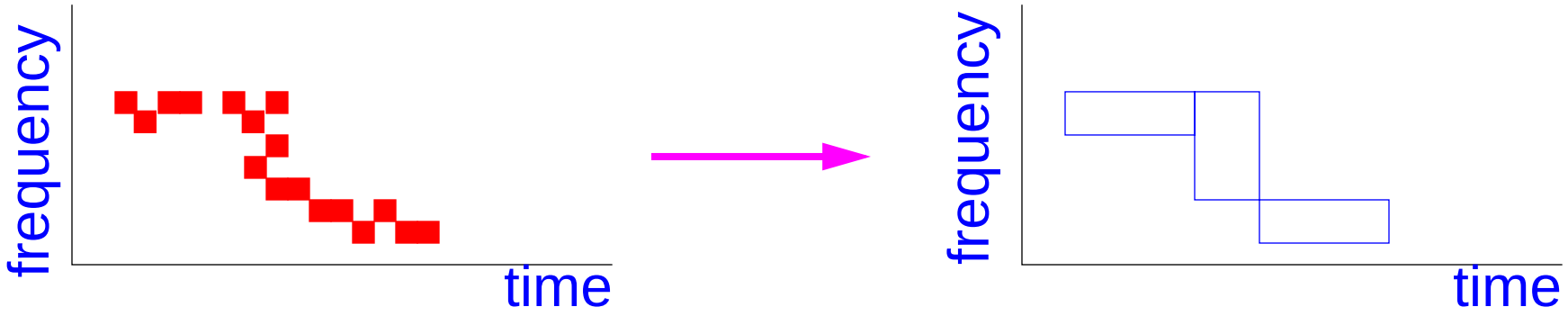
Event Catalog

- Allows definition of events as arbitrary groups of rectangles

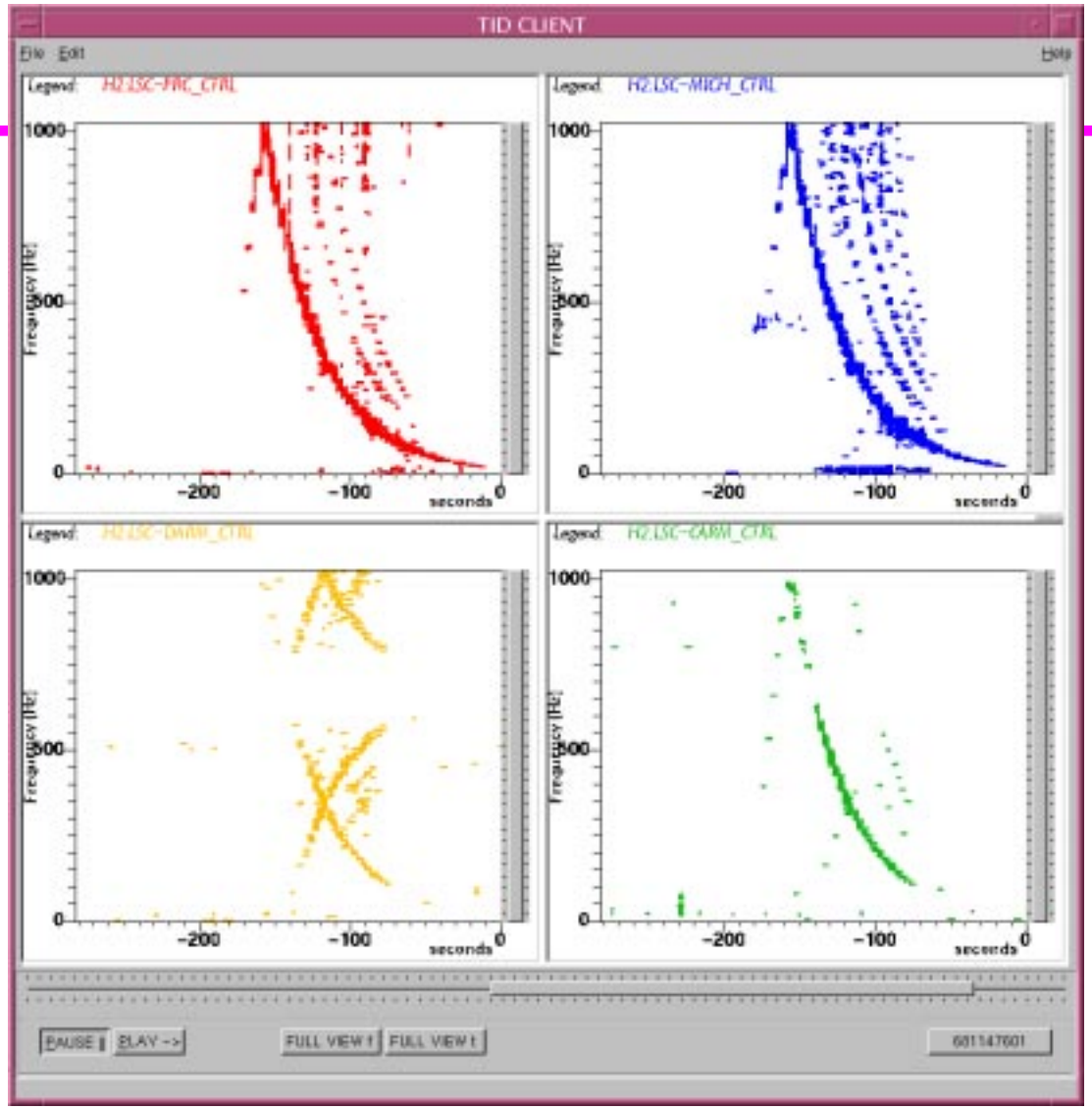


- Computes a cost for each pattern:

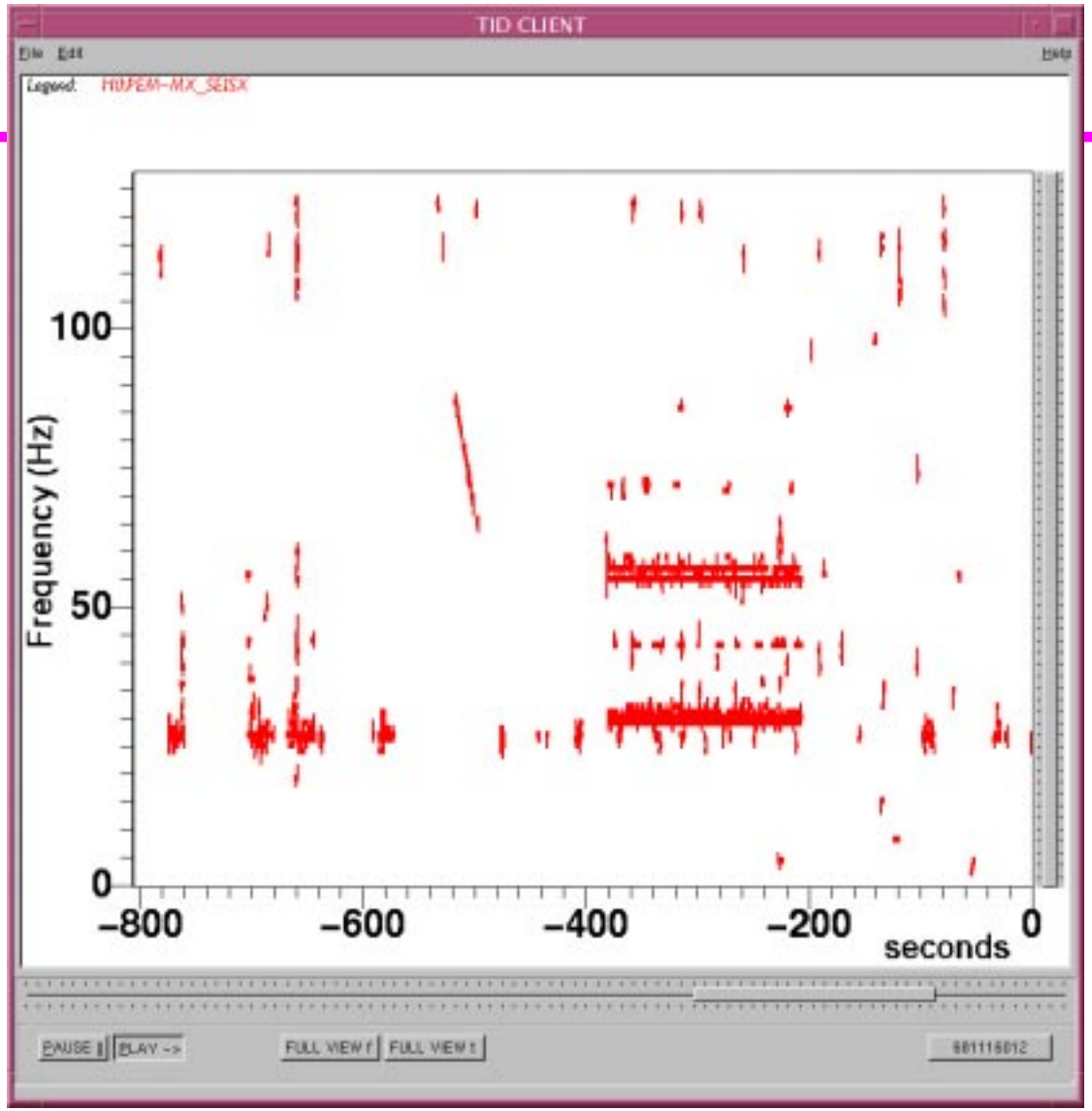
  cost = #(black that should be white) + α #(white that should be black)

- Exports triggers to HTML or ASCII files
- Writes triggers to the LDAS database via the DMT trigger manager

Example: E5 sweeps



Example: seismometer signal

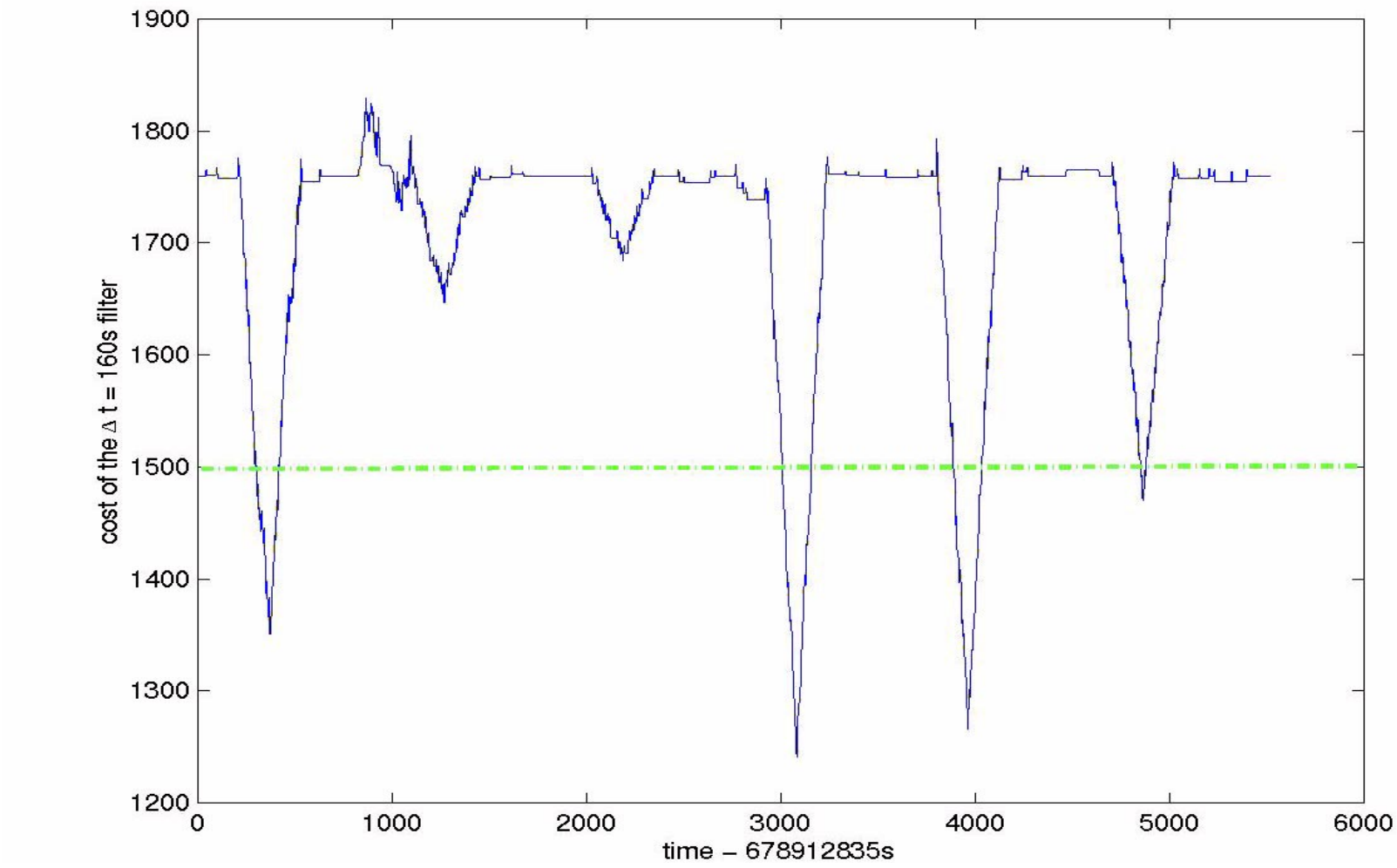


Example: seismometer signal

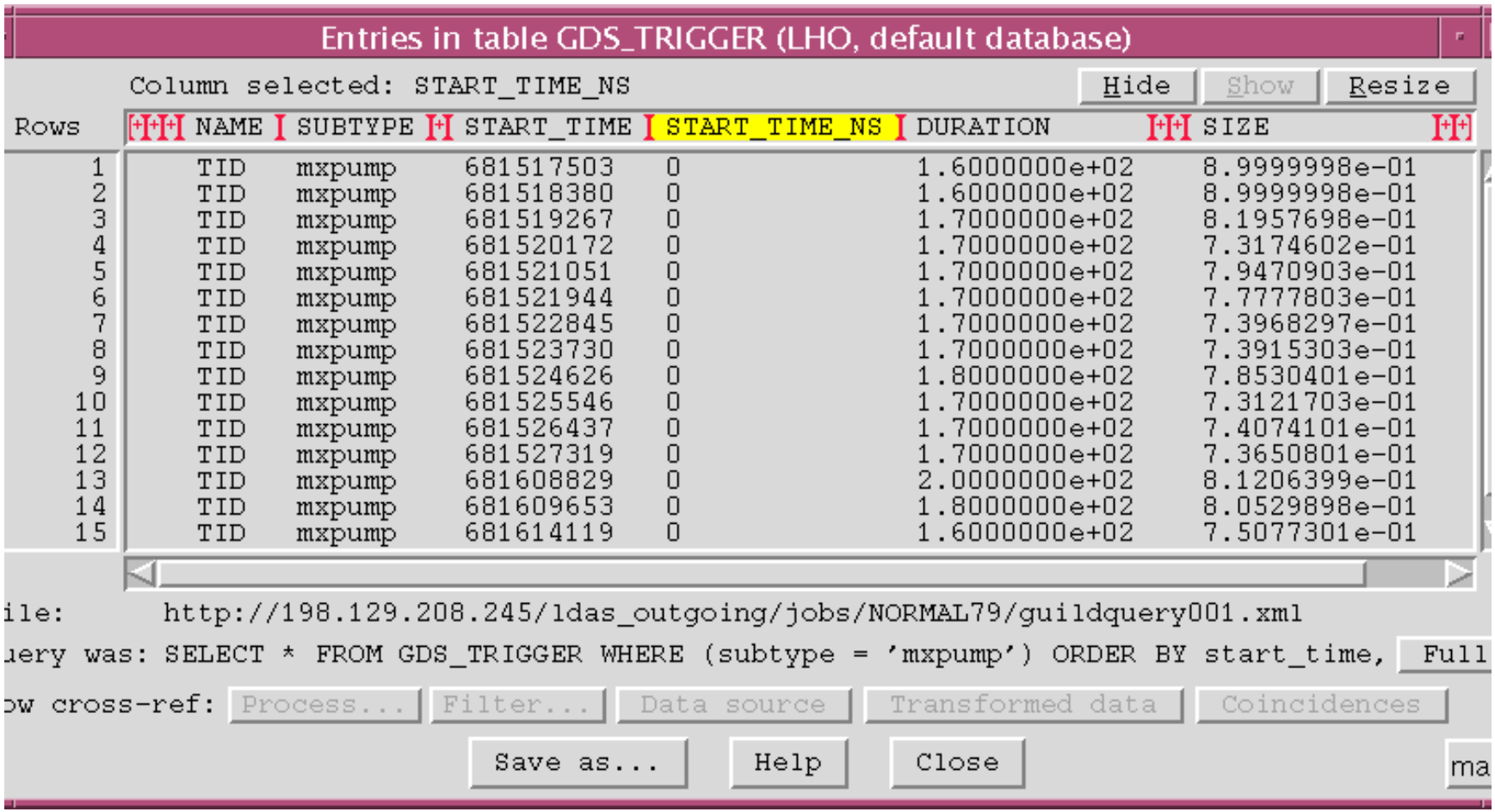
- File mxpump.tid:

```
# name of the event class
class mxpump

...

# name of channel to search
channel=H0:PEM-MX_SEISX

# declaration of variables
var(t,160,200,5)

# declaration of rectangles
rectangle(5,t+5,27,33,0,t+10,25,35)
rectangle(5,t+5,55,57,0,t+10,53,59)
rectangle(5,t+5,70,73,0,t+10,68,75)

# mandatory end statement to terminate the class declaration
end
```

Example: seismometer signal



Example: seismometer signal



More information

- http://web.mit.edu/julien/www/tid/tidhowto.html
  - ››documentation on server, viewer, catalog
  - ››download
  - ››installation instructions