CSS Post-Analysis Tool: FFT, Correlation Plot, Gaussian, etc.

EPICS Meeting – Control System Studio

DESY, April 2007

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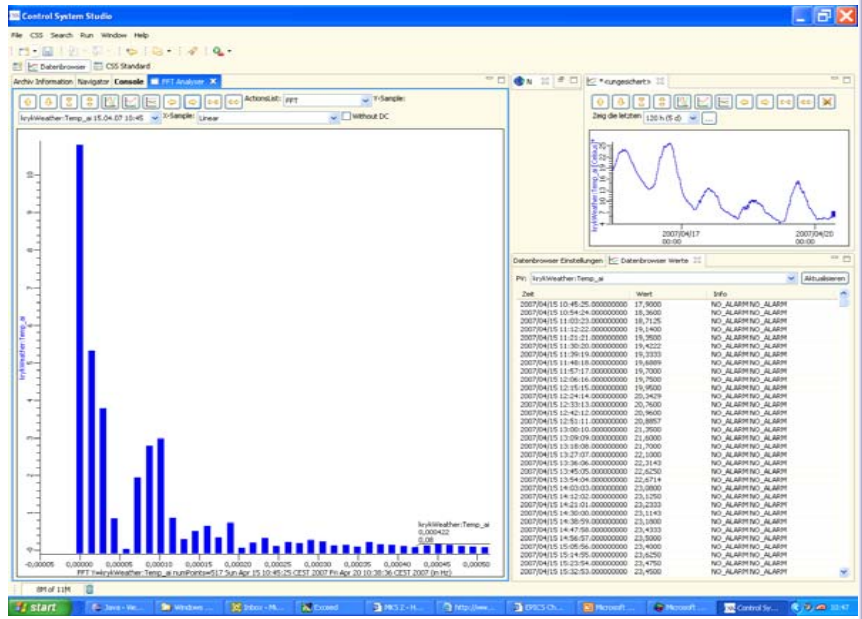
ArchiverData Analysis

- CSS has access to Archive Data (Databrowser).
- What's about immediate Analysis? (vs. Matlab, Mathematica etc)
- Small plugin for that was written.
- Preliminary name –"Post-Analysis"
- Currently we can handle
  - ⇒ **FFT (normal and Hamming, Bartlett, etc)**
  - ⇒ **Correlation plot**
  - ⇒ **Gaussian fitting**

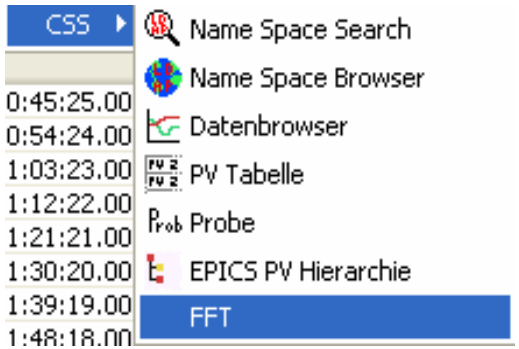


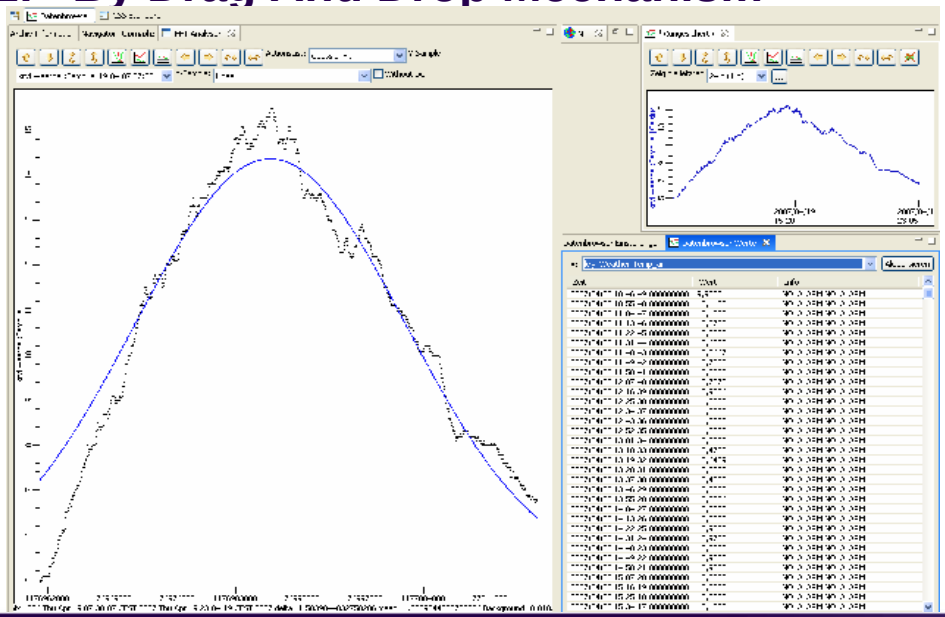
A Mechanism to Receive Data

How data coming from Databrowser to PostAnalysis Plugin?

We're using 2 comfortable way –

1. **By Mouse Button Click pull-down Menu (Object Contribution)**
2. **By Drag And Drop Mechanism**



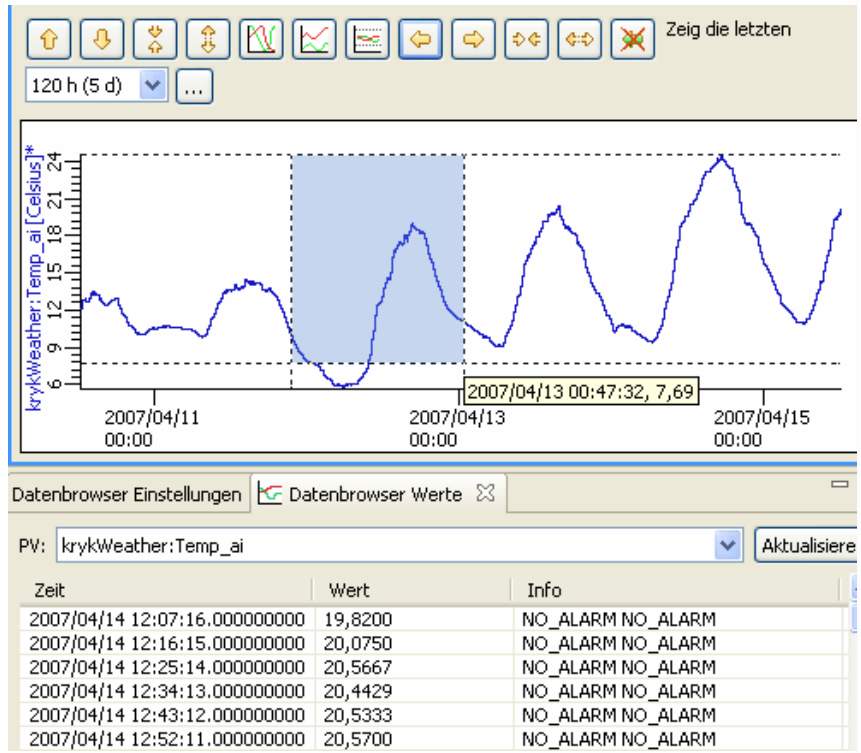


Internal data contribution mechanism

Special Datatype under org.csstudio.platform.internal.module was created

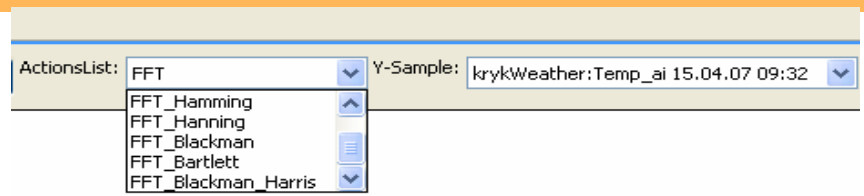
- double[] sampleValue, timeStamp;
- String[] Status,Severity
- double low,high
- String egu

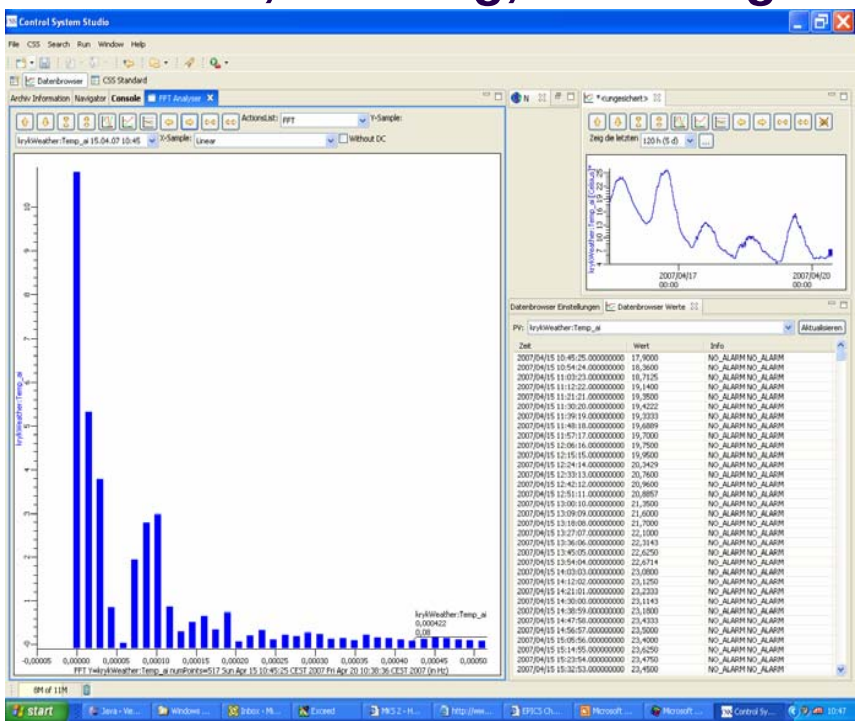
Currently this Datatype is accessible only in databrowser sample Table . Should be extended to main databrowser window as well.



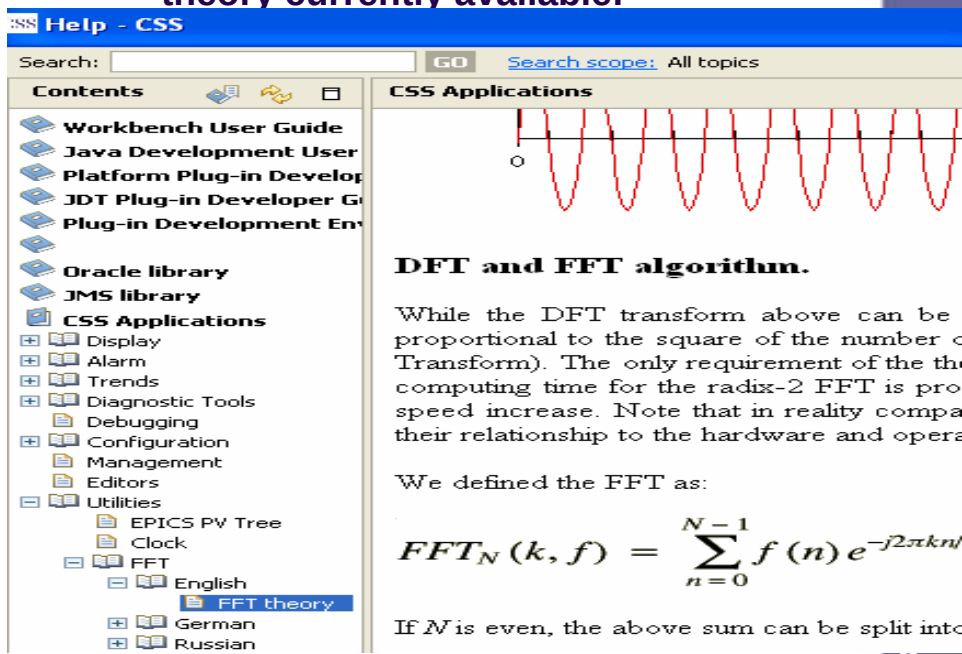
FFT

We provide normal FFT and most popular window functions Bartlett, Hanning, Hamming



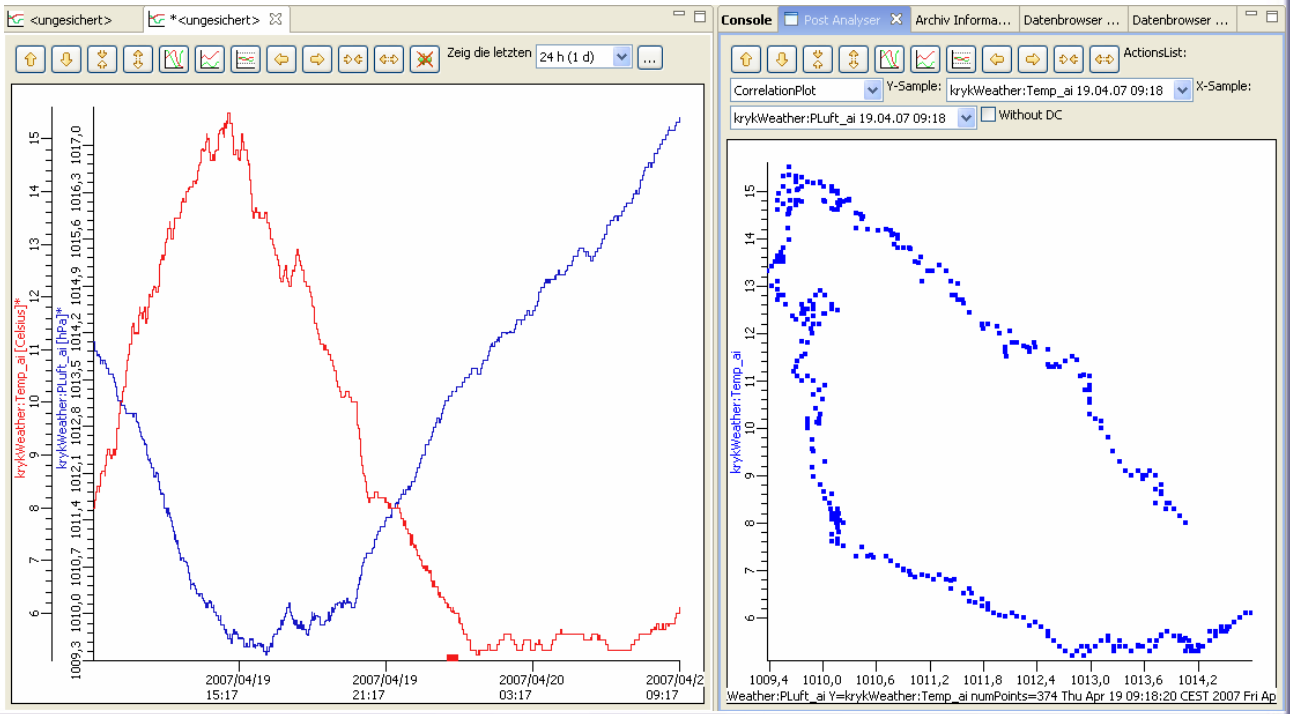


On-line internal CSS-help with some FFT theory currently available:



Correlation Plot

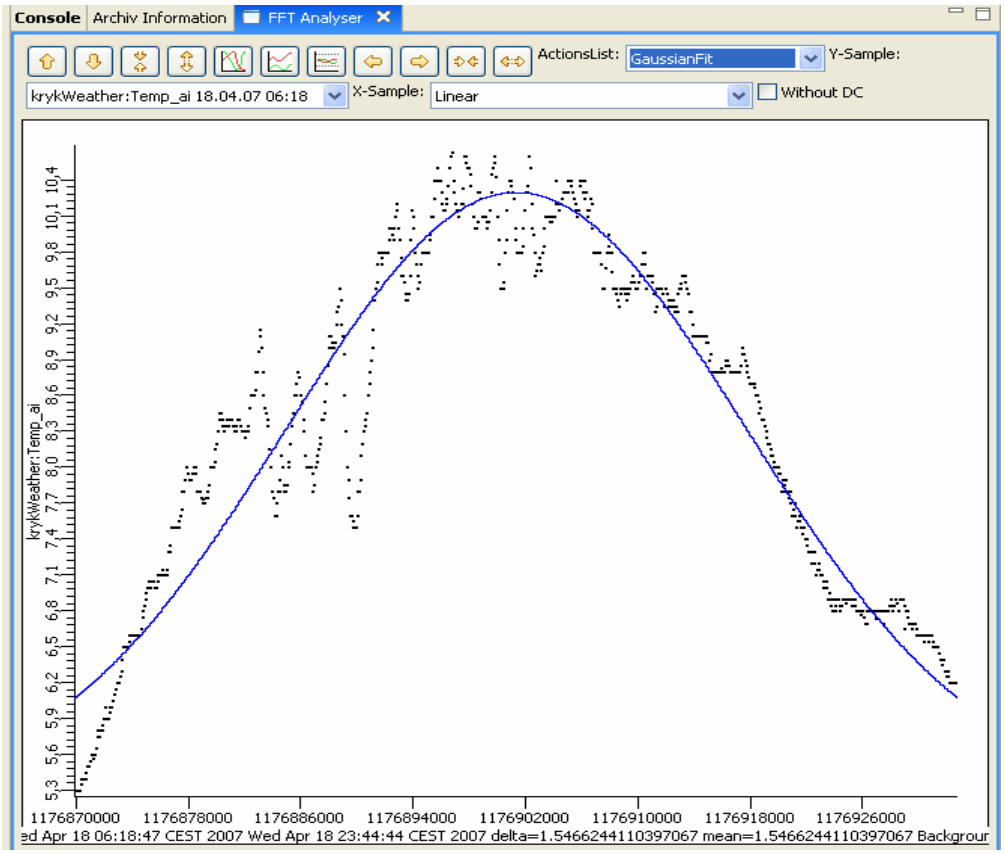
CorrelationPlot creates XY-plot from 2 archive samples x(t) y(t):



Gaussian Fitting:

GaussianFit tries to find best fit to $f(x) = ae^{-(x-b)^2/c^2}$

Using LSF (least squares fitting algorithm)



Conclusion: To do/enhancements:

- Extend SampleDataType for main Databrowser Chart Window.
- Add ToolTips or another Labels for CorrelationPlot
- Get data from other plugins (i.e. waveforms in SDS)
- Another Transformation (for example Linear Fitting?)
- Formulas support (i.e. draw C = ($PV1 -$PV2)**2)
- Any other ideas?