

# ADEI for Tango

## *Advanced Data Extraction Infrastructure*



High-performance dynamic web-interface to slow-control time series data with Google-style navigation

## Agenda

➤ Perspectives

➤ Architecture

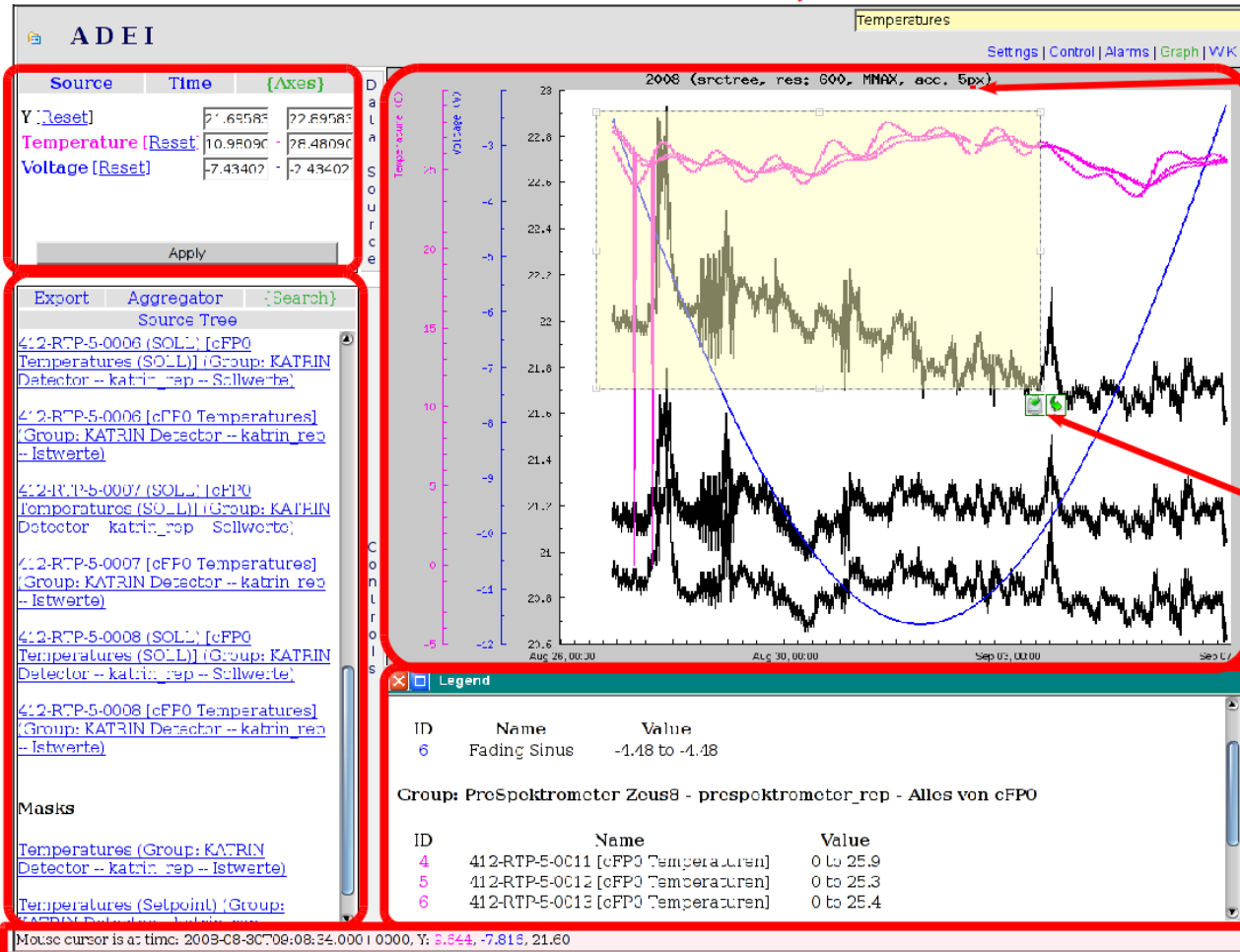
➤ Perspectives

**Graph window, Mouse navigation,  
Selection area, Context information**

**Pull down menu**

**Data source, time,  
and range controls**

**Various options,  
Search results**



The screenshot shows the ADEI software interface. At the top left, there is a table with columns 'Source', 'Time', and '{Axes}'. Below it is an 'Apply' button. To the right of the table is a 'Sources Tree' with a search box and a list of data sources. The main part of the interface is a graph window titled 'Temperatures' showing multiple data series over time. A yellow shaded area indicates a zoomed-in section of the graph. A red box highlights a selection area on the graph. Below the graph is a 'Legend' window with a table of data series. At the bottom, a status bar shows the mouse cursor position and time.

Source	Time	{Axes}
Y [Reset]	7.69585	77.69585
Temperature [Reset]	10.98090	78.48090
Voltage [Reset]	-7.43407	-7.43407

ID	Name	Value
6	Fading Sinus	-1.48 to -1.48

ID	Name	Value
4	412-RTP-5-0011 [cFPO Temperaturen]	0 to 25.9
5	412-RTP-5-0012 [cFPO Temperaturen]	0 to 25.3
6	412-RTP-5-0013 [cFPO Temperaturen]	0 to 25.4

Mouse cursor is at: time: 2009-08-30T09:08:34.000 | 0300, Y: 5.544, -7.815, 21.60

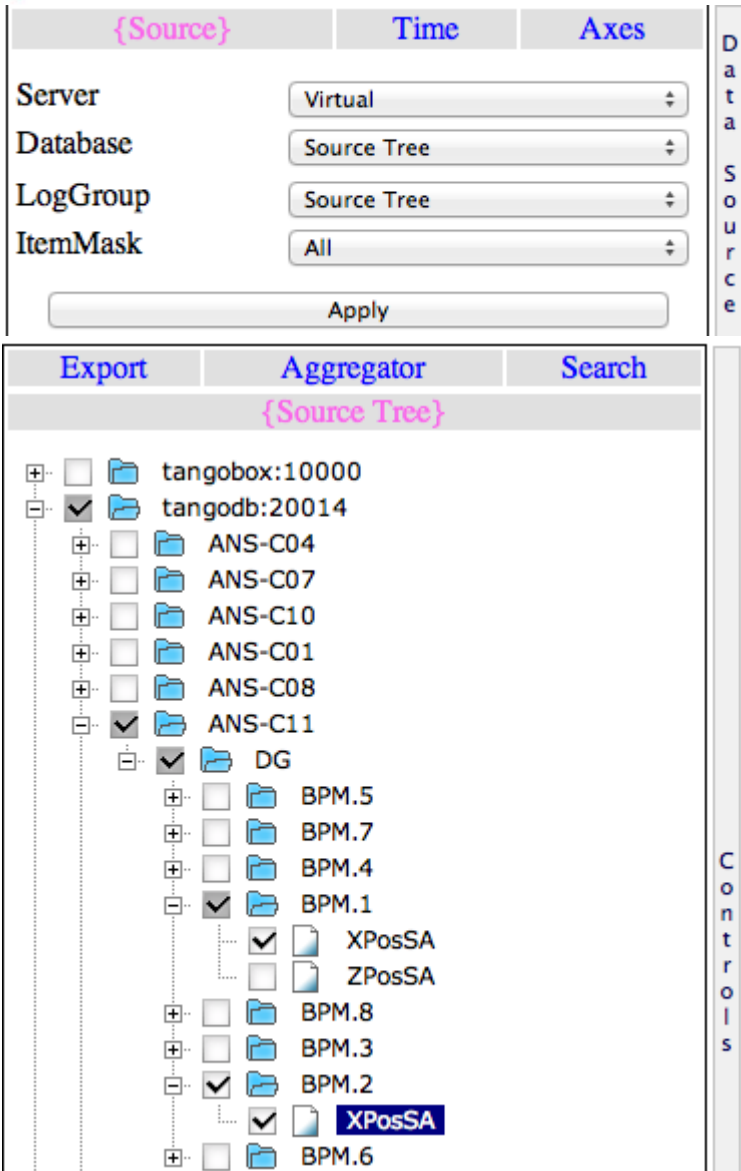
**Invalid data  
indication**

**Selection  
Zoom-in, Save**

**Status bar**

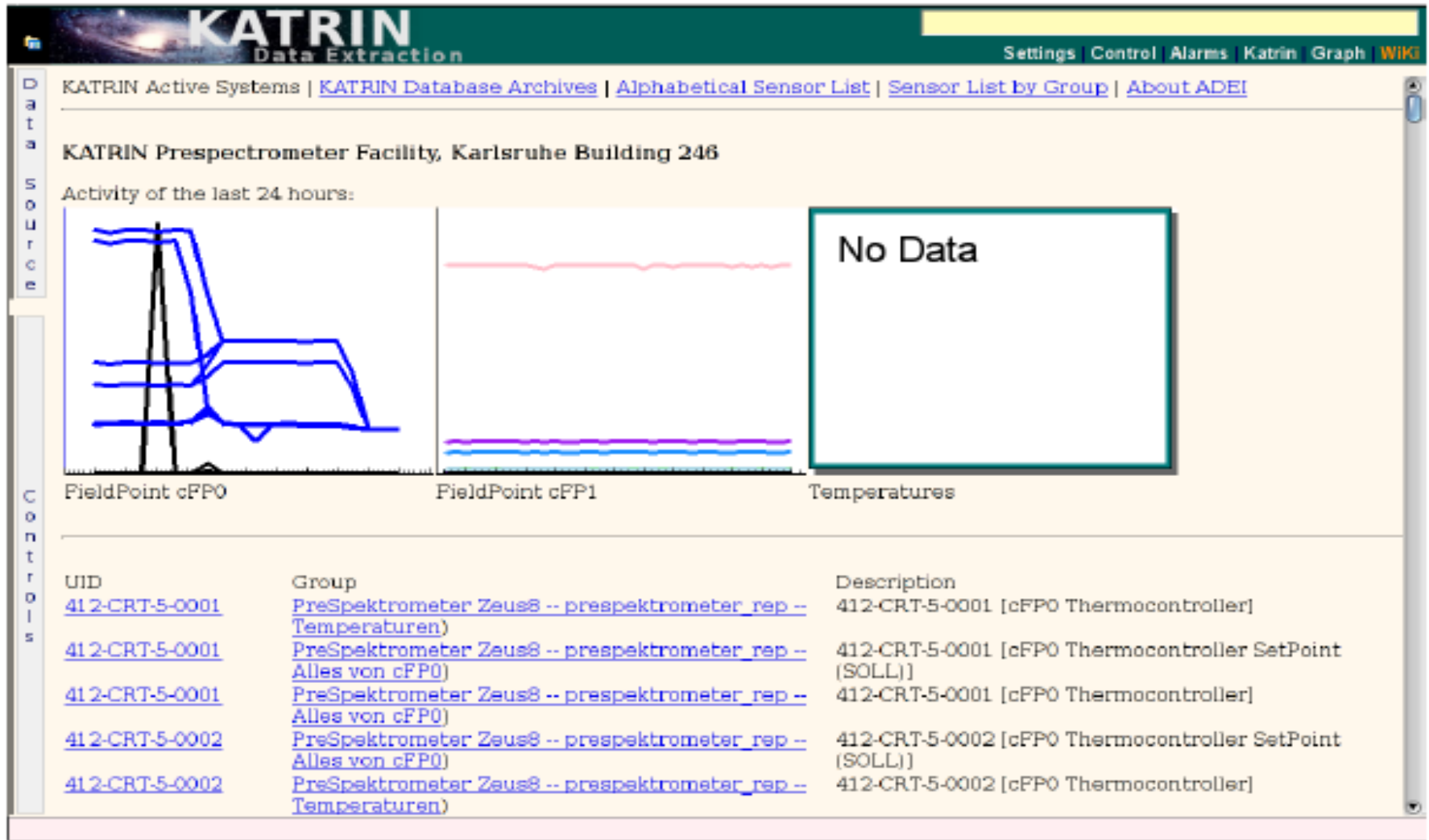
**Sensor list**

# Data Hierarchy

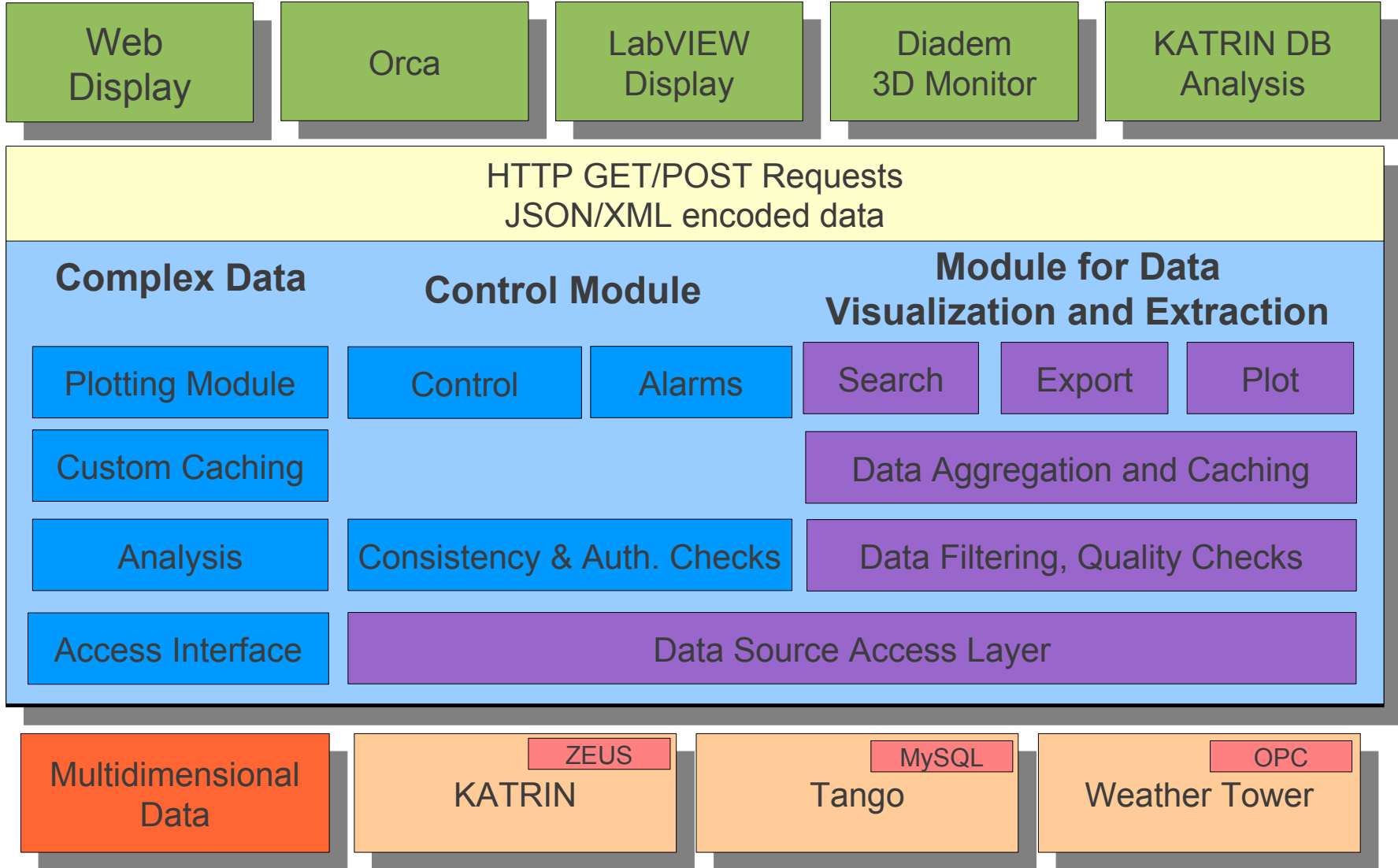


The screenshot shows the ADEI Data Hierarchy interface. At the top, there are three tabs: {Source}, Time, and Axes. Below these are four dropdown menus: Server (Virtual), Database (Source Tree), LogGroup (Source Tree), and ItemMask (All). An Apply button is located below these menus. To the right of the dropdowns is a vertical label 'Data Source'. Below the dropdowns are three tabs: Export, Aggregator, and Search. The main area is titled {Source Tree} and displays a hierarchical tree structure. The tree starts with 'tangobox:10000' and 'tangodb:20014'. Under 'tangodb:20014', there are several folders: ANS-C04, ANS-C07, ANS-C10, ANS-C01, ANS-C08, and ANS-C11. Under 'ANS-C11', there is a folder 'DG'. Under 'DG', there are several folders: BPM.5, BPM.7, BPM.4, BPM.1, BPM.8, BPM.3, BPM.2, and BPM.6. Under 'BPM.1', there are two files: XPosSA and ZPosSA. Under 'BPM.2', there is a file 'XPosSA' which is highlighted in blue. To the right of the tree is a vertical label 'Controls'.

- **Server**
  - Independent source of data
  - Own configuration, data access rules
  - Multiple servers per ADEI setup
- **Database**
  - Multiple related data sources
  - System components
  - Experiments for the same component
- **LogGroup**
  - Sensors with same timestamp
- **Mask**
  - Selection of sensors
  - All / Preconfigured / Items
- **Virtual / Source Tree**
  - Selection of sensors from all groups
  - Preconfigured
  - Dynamic choice with Source Tree



# ADEI Architecture



*Sample Query: [http://adei.org/services/?service=list&target=items&db\\_server=katrin&db\\_name=prespec&db\\_group=0](http://adei.org/services/?service=list&target=items&db_server=katrin&db_name=prespec&db_group=0)*

Client Applications

HTTP GET/POST Requests  
JSON/XML encoded data

```
<?xml version="1.0" encoding="UTF-8"?>
<result>
  <Value value="0" name="412-RPV-3-0005"/>
  <Value value="1" name="412-RTP-5-0011"/>
  ...
</result>
```

getdata

getimage

legend

search

list

control

ADEI Web Services

## Request data in TDMS format:

```
http://ipepdvadei.ka.fzk.de/adei/services/getdata.php db_server=toskanadb&db_name=prespektrometer_rep&db_group=0&experiment=0&window=1211159859-1211241600&format=tdms
```

db\_server  
db\_name  
db\_group  
db\_mask

} Addressing data channels

experiment  
interval

} Addressing data interval (UNIX timestamps)

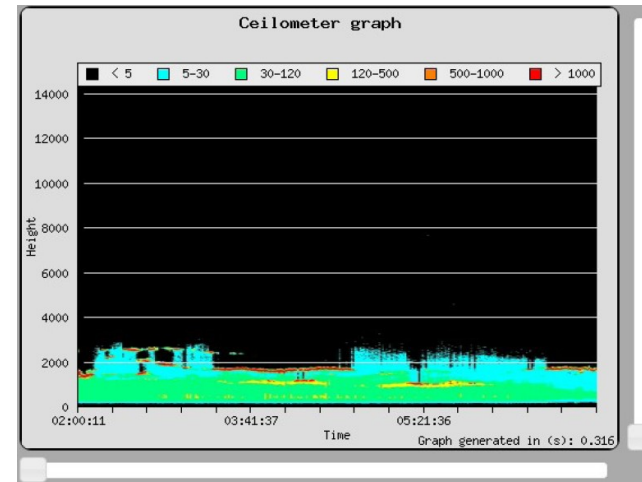
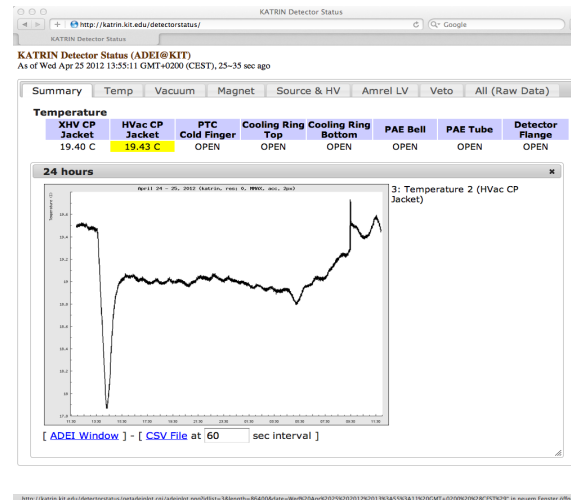
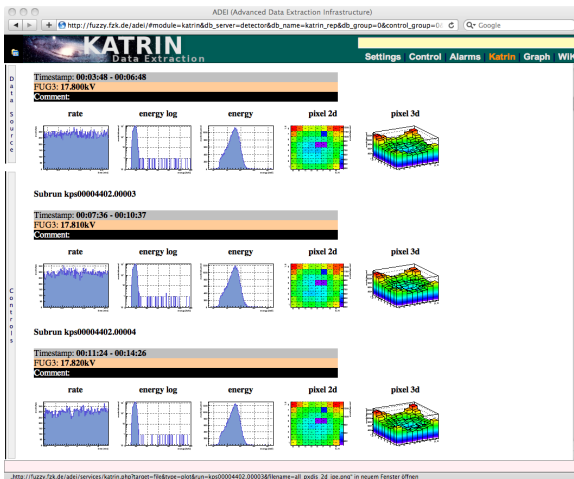
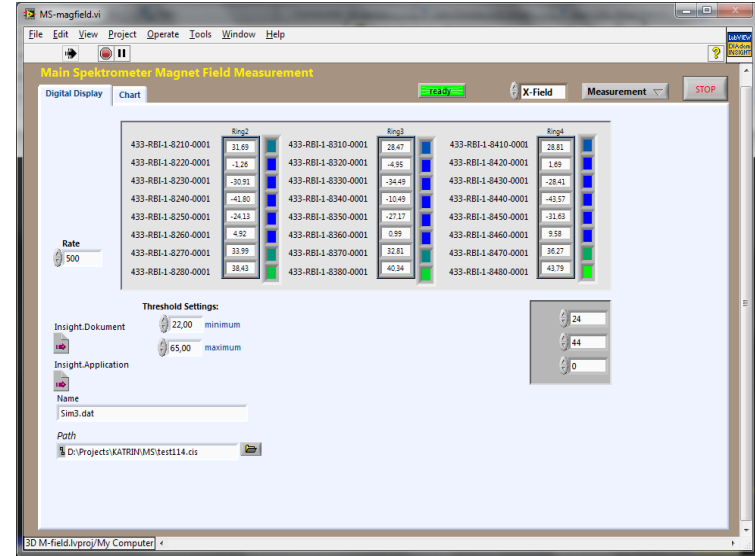
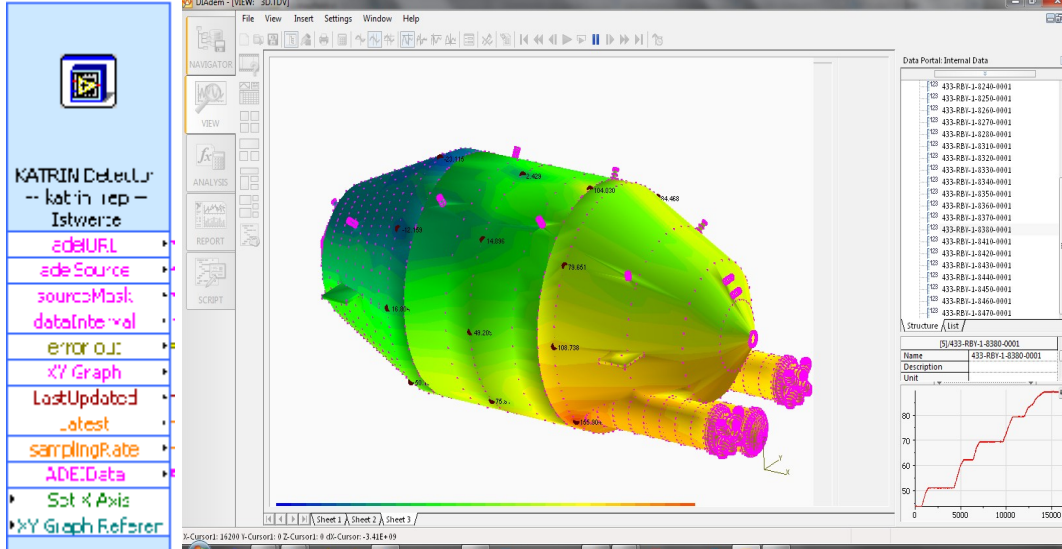
format

Required format (CSV, Excel, TDMS, ROOT)

resample

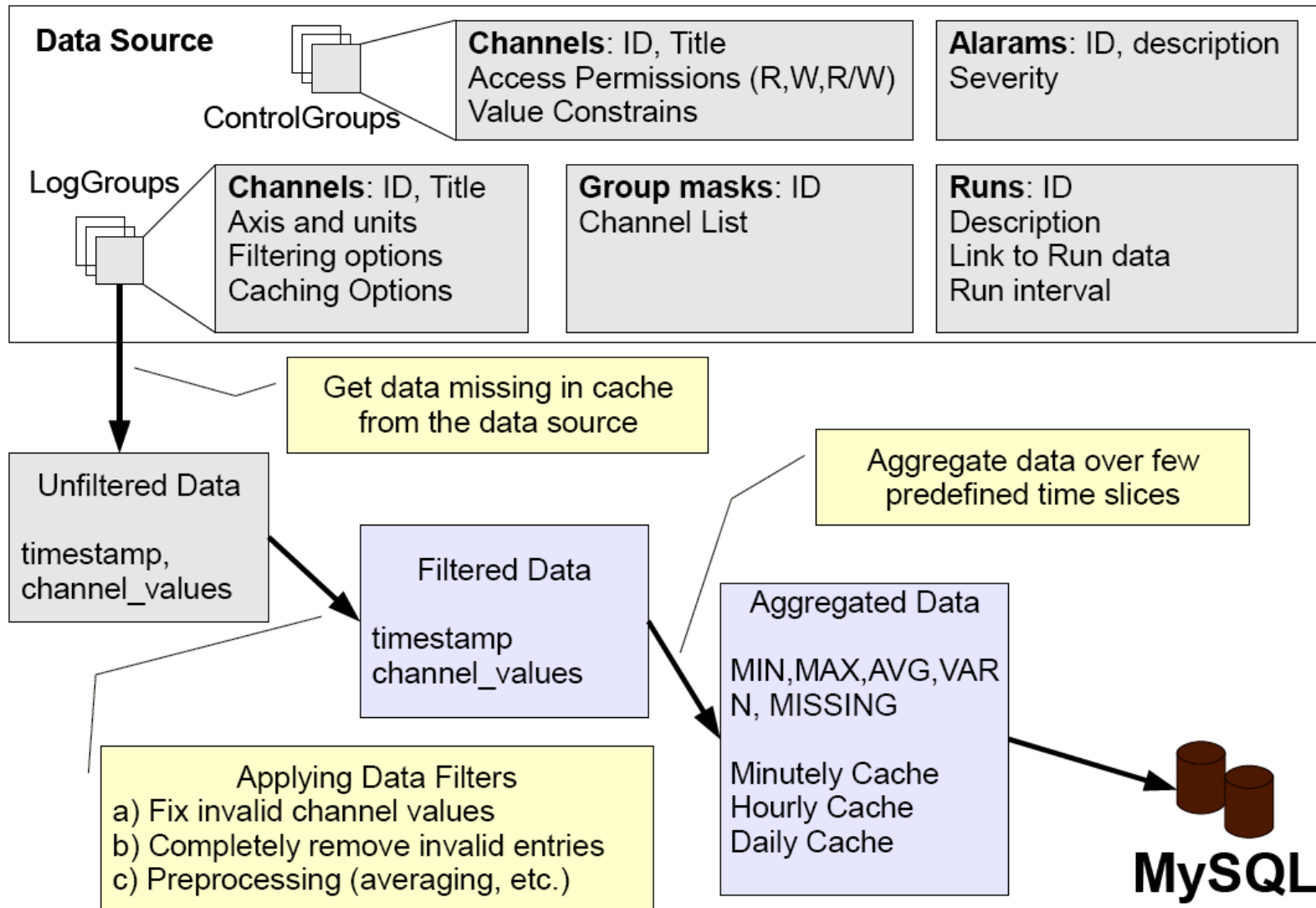
Requested sampling rate (in seconds)

# Integration

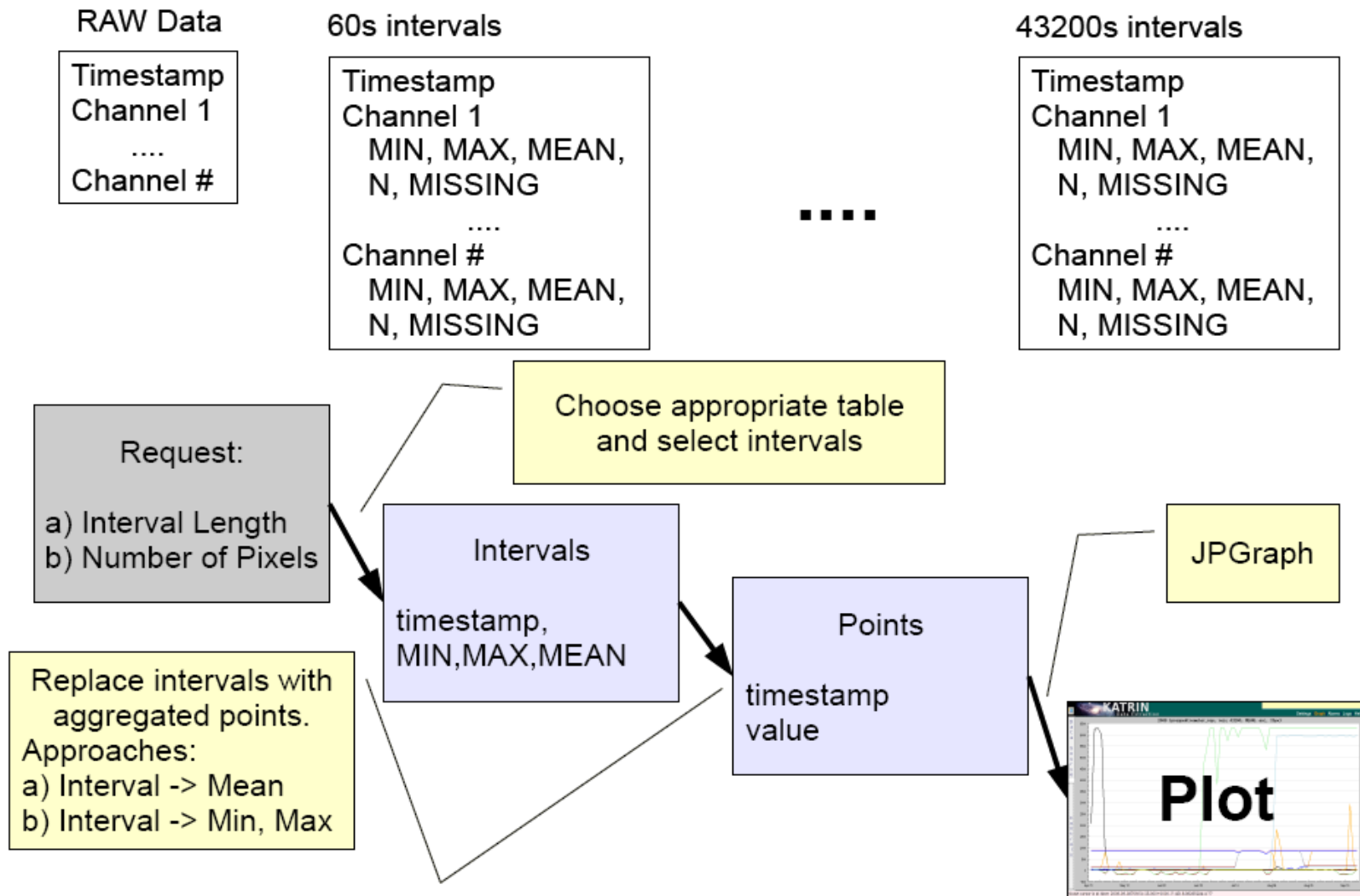




# Data Flow: Caching

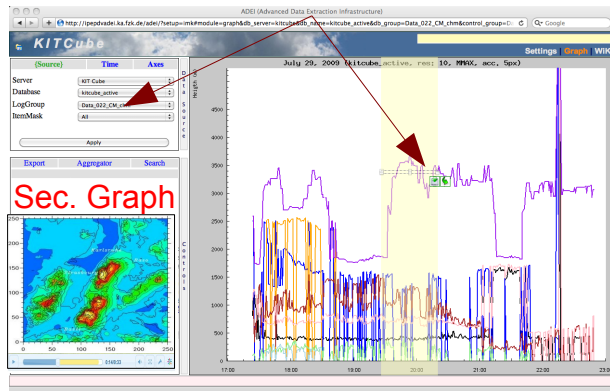


# Data Flow: Plotting

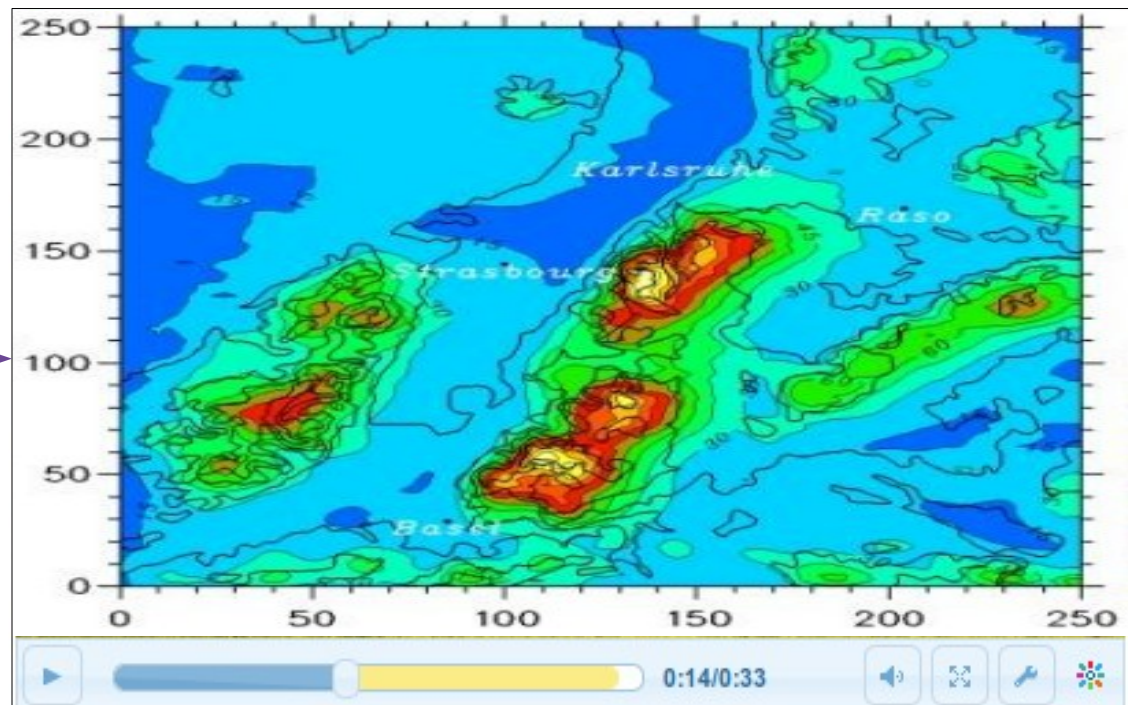


- HTML5 (Client-side rendering & analysis)
- Custom Views & Multidimensional Data
- 3D Visualization with WebGL
- Annotations & tighter WiKi integration
- Modern Hand-held Devices

## Data Selection



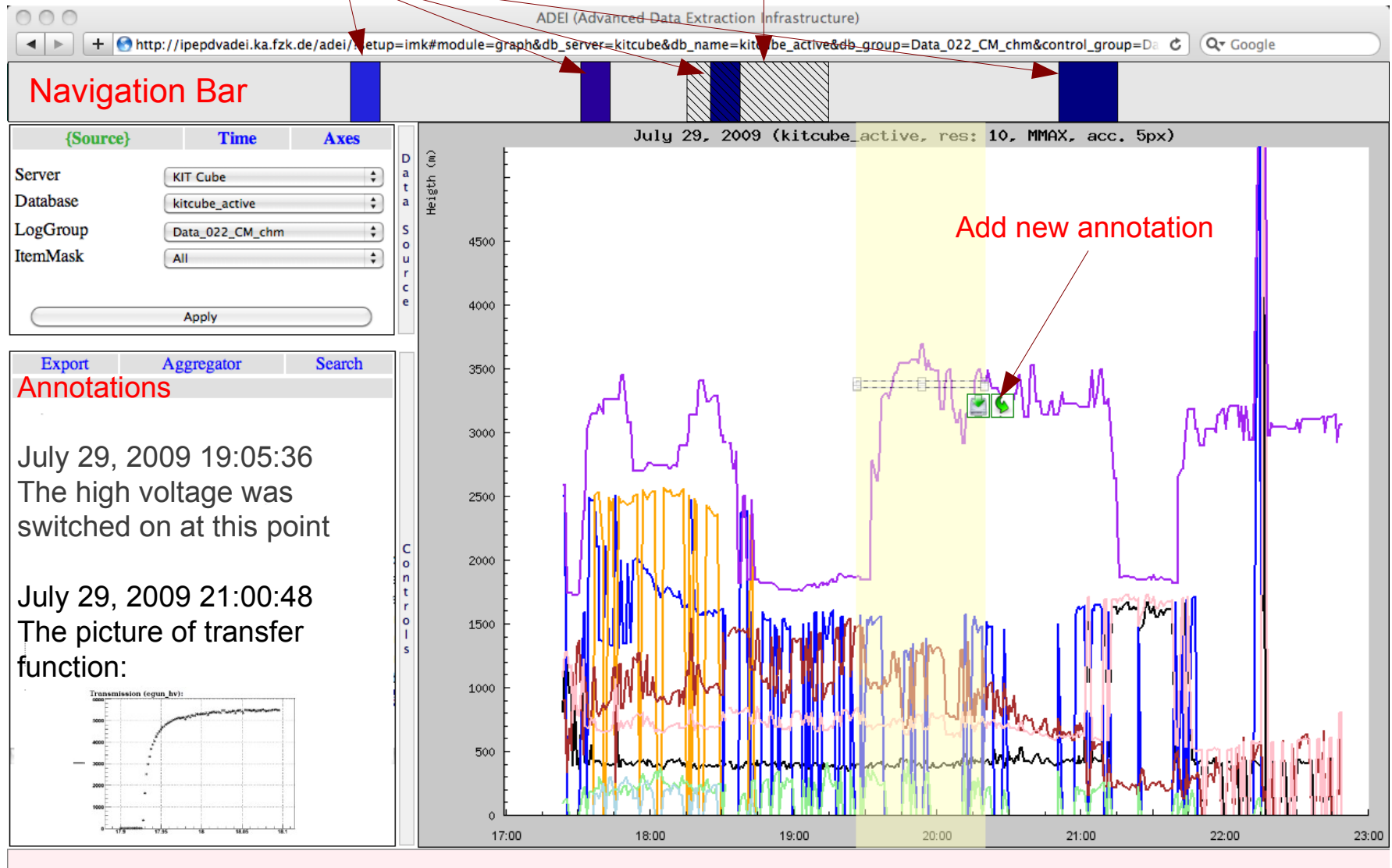
- Playback multidimensional image of dynamic process in secondary graph window



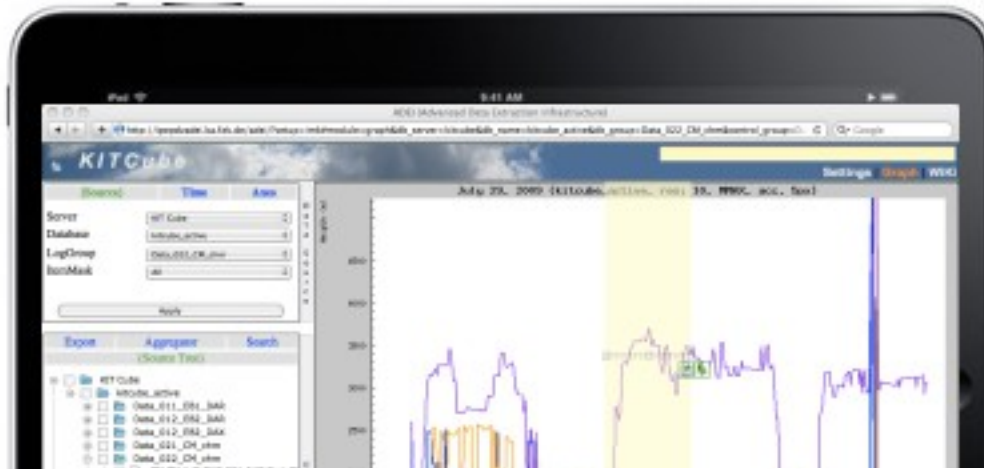
# ADEI Chart Annotations

Annotations exist

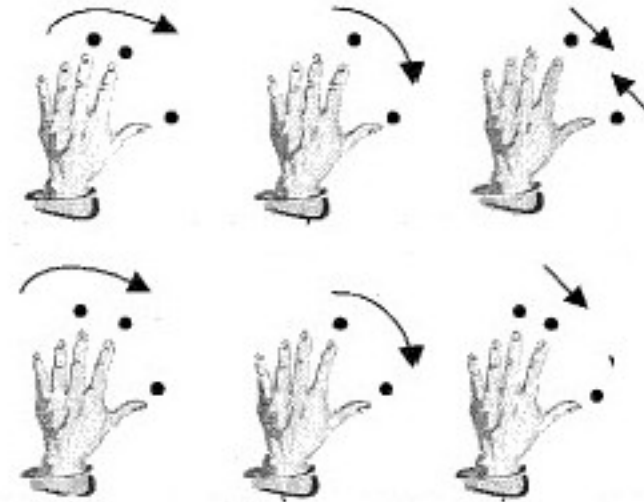
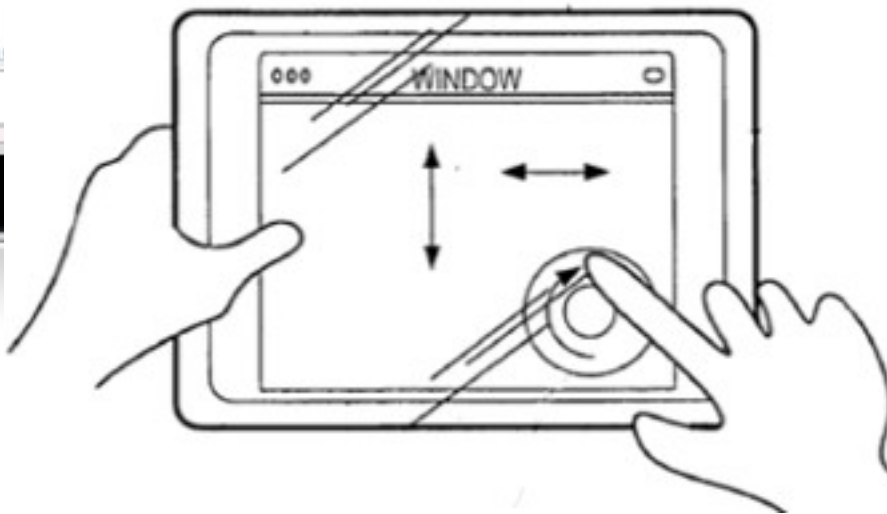
Current window



# Support gestures on hand-held devices



- Apple iPhone and iPad
- Google Android
- MeeGo by Nokia + Intel
- Microsoft WinMobile 7



## <http://adei.info>

Requirements: Linux, Apache, MySQL, PHP

Supported browsers: IE, Mozilla, Chrome, Safari, Opera, ...

Supported sources: SQL Databases, Simple Plugins...

Export formats: Excel, CSV, TDMS, ROOT, Plugins...

Application Integration: Simple Web API

Resolution: From century overviews to 100 Hz

Speed: Interactive at any zoom level ( ~ 100 - 200 ms )

Applications: Cosmic Ray Physics (Armenia), High Energy Physics (KIT), Meteorology (KIT)

Development: KIT, YerPhI

License: GPL (Open Source)