Grain

- TDR RDT analysis in Java2 -

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Roadmap

- The Challenge
- Toolbox
- Event Parsing
- RDT Analysis
- Current Status
- Benchmarks
- Outlook

The Challenge

The task is to:

convert a time-ordered, unstructured stream of all the data items

into

temporally and spatially correlated groups of filtered data (aka. events)

and

to provide an easy to use framework with which to work with the events.

Toolbox

Object Orientated Programming:

- Abstraction - Need to know basis
- Encapsulation - Black Box Approach
- Inheritance - “Is a” relationships
- Reuse - Write once, use everywhere

No need for a specific sorting language, thus all the features in the primary language are available!

Toolbox

Java2 Platform:

- Clean OO programming language implementation.
- Write once, run on almost anything.
- Includes networking, a GUI, DB access, ...
- Modern JITted code runs fast!
- Free (as in beer...)

http://java.sun.com

Event Parsing

Question:

How to handle the event parsing in a tested, working way?

Answer:

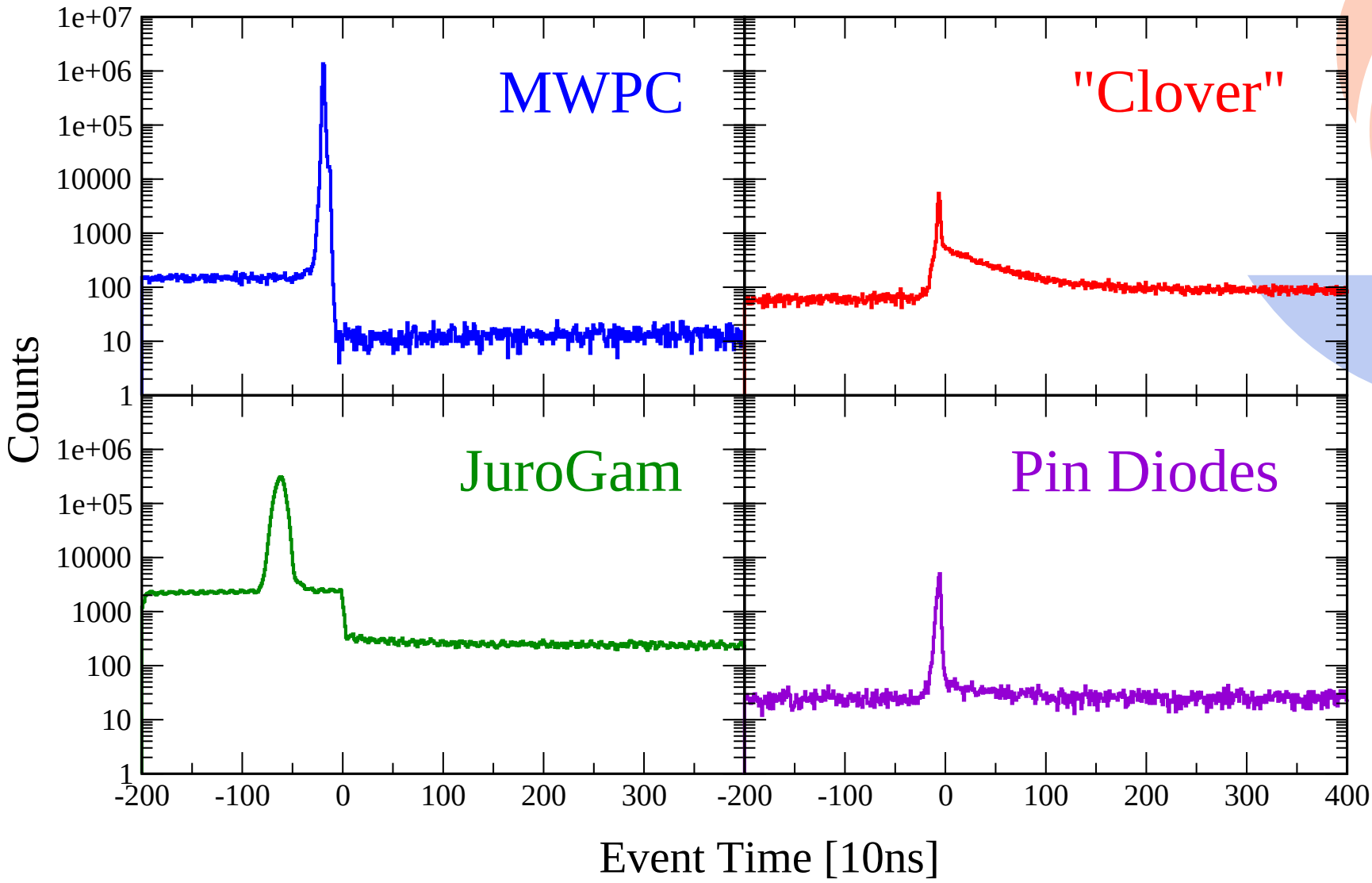
Emulate the “old-style” triggered system in software.

Method:

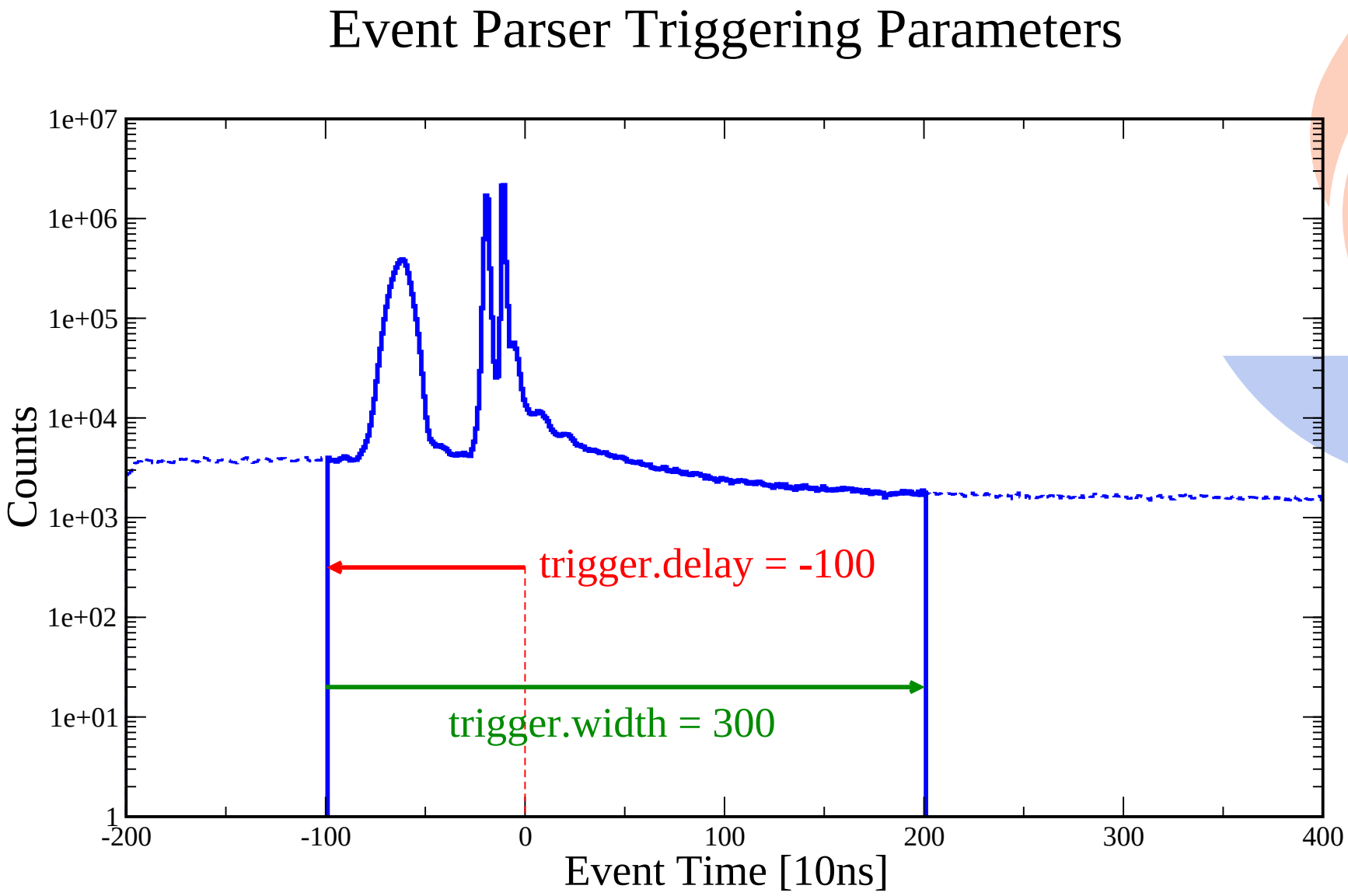
Trigger only from the OR(DSSD) and work at first only in the time domain!

Data time structure

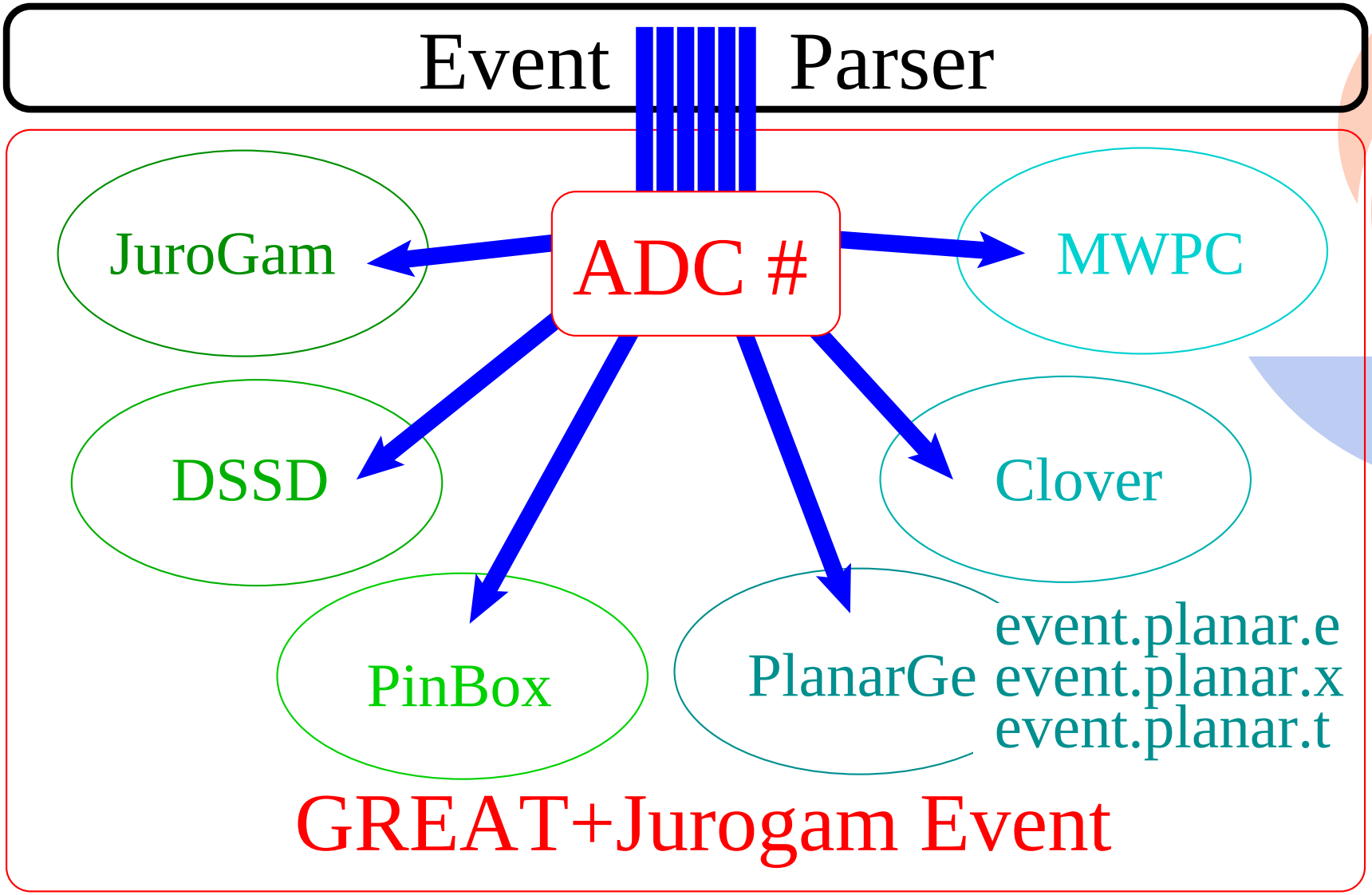
Detector time stamps in respect to OR(DSSD)



Trigger Setup

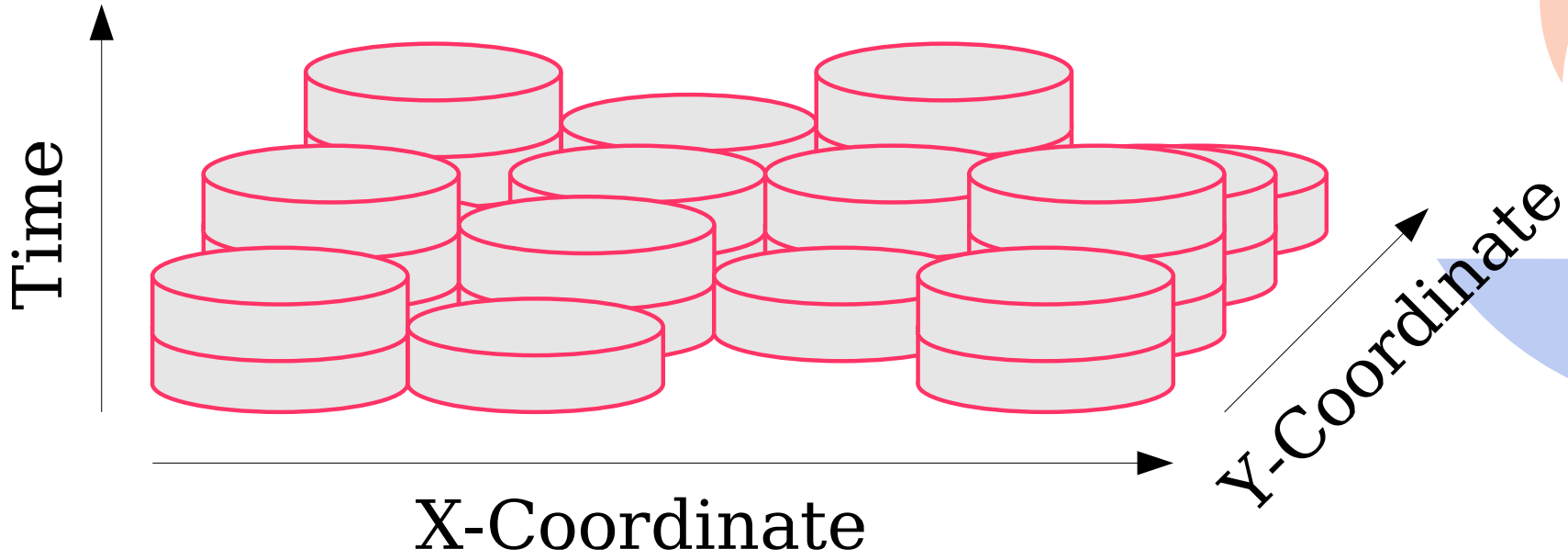


Event Internals



DSSD Tagger for RDT

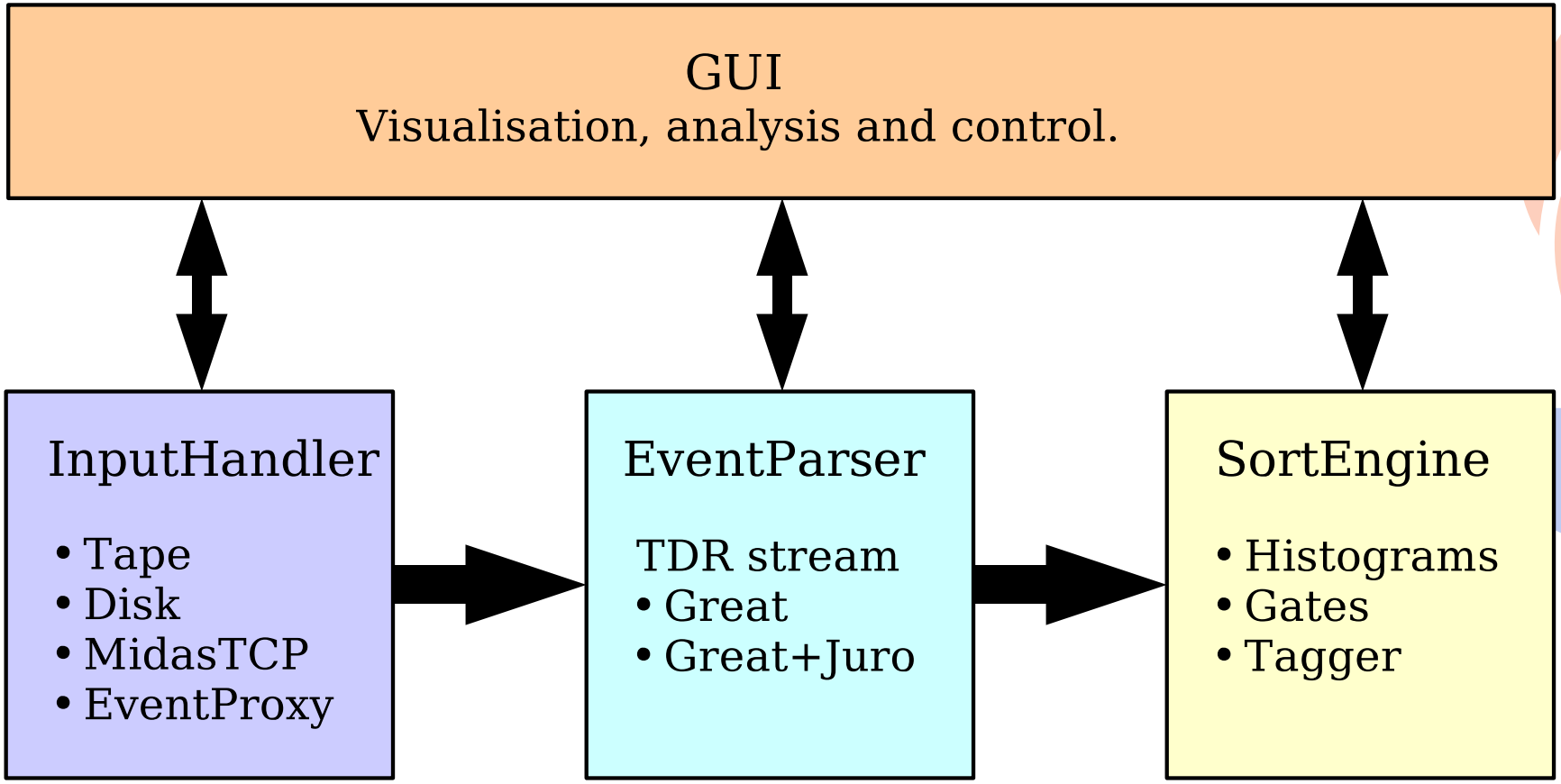
tagger = new Tagger(x,y,searchtime);



tagger.put(currentevent);

previousevents =tagger.getall(currentevent,strategy);

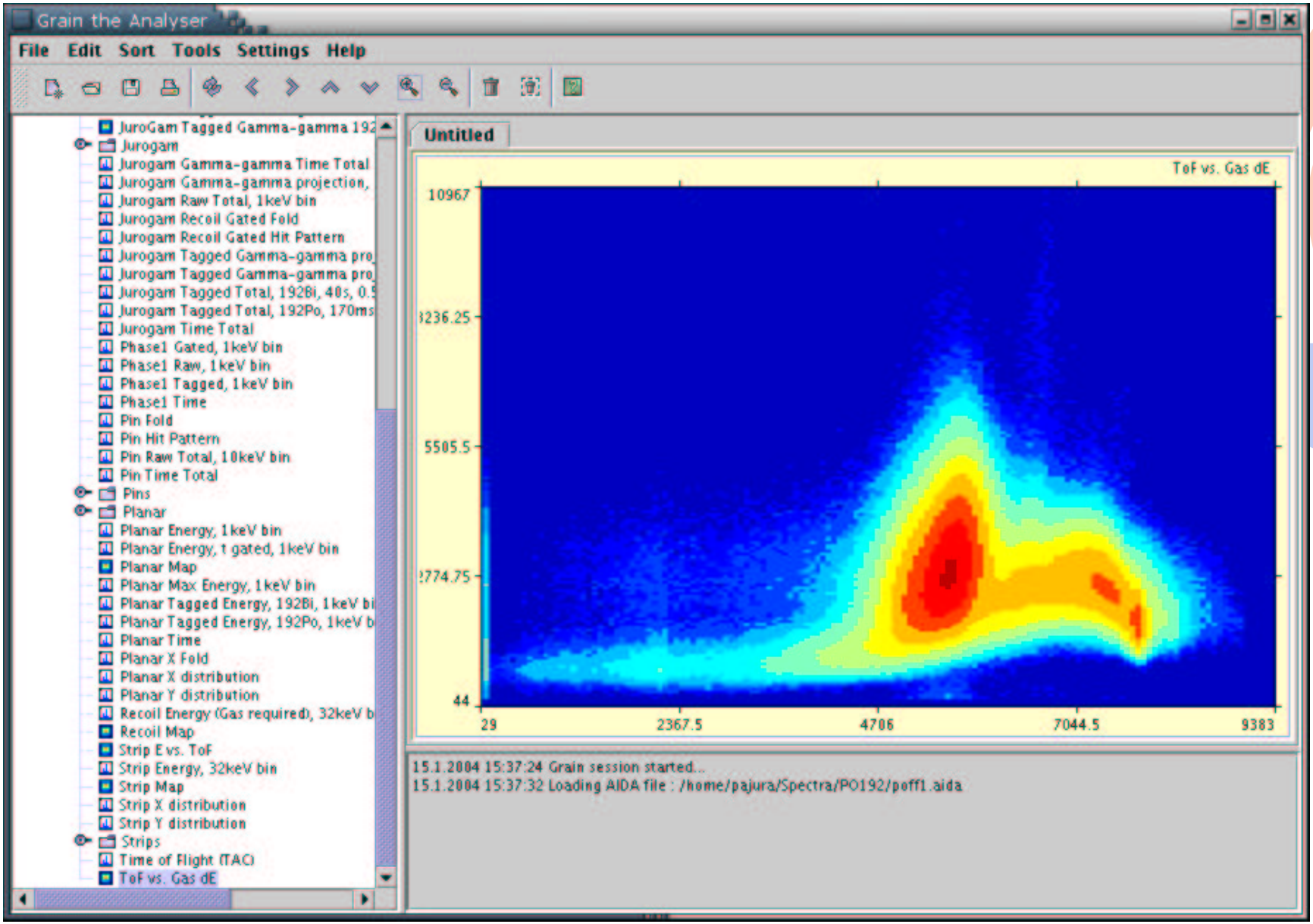
Current Status - Engine



Histogramming and some analysis tools are from the AIDA project.

http://aida.freehep.org

Current Status - GUI



Benchmarks

Po192, TAPE01, R3, GreatEB prefiltered
PoOnline2.java, po192-ep.conf, po192-3.gains
Grain Beta 2/3
Java opts “-Xmx(0.5*RAM)MB -server”

System	Processor	RAM	Source	OS	Java	MB/s	Limiting
greatDA	2xAthlon2000MP	512	DLT8000	Linux	Sun1.4.2	3.4	IO(tape)
pollux	2xUSparc400MHz	512	DLT8000	Solaris	Sun1.4.1	2.8	EParser
”	”	”	SCSIDisk	”	”	2.8	EParser
phys157	2xAthlon2000MP	1024	IDEDisk	Linux	Sun1.4.2	12.1	EParser
”	”	”	”	”	IBM1.4.0	17.9	EParser
rahkila	Pentium4M 2GHz	512	IDEDisk	WinXPP	Sun1.4.2	14.2	???
”	”	”	”	Linux	Sun1.4.2	12.4	EParser
testamd	2xAMD64-244	2048	IDEDisk	Linux	Bdw1.4.2	36.7	EParser

Outlook

- Release version 1.0 in Q1 2004.
- Simplifications to sorting (generics) from Java relase 1.5 (Q3 2005).
- Real-Time analysis using database queries (JDO).
- Design and implement proper client-server architecture.
- Investigate compatability with GRID platforms (Globus).

http://phys157.phys.jyu.fi/grain/index.html