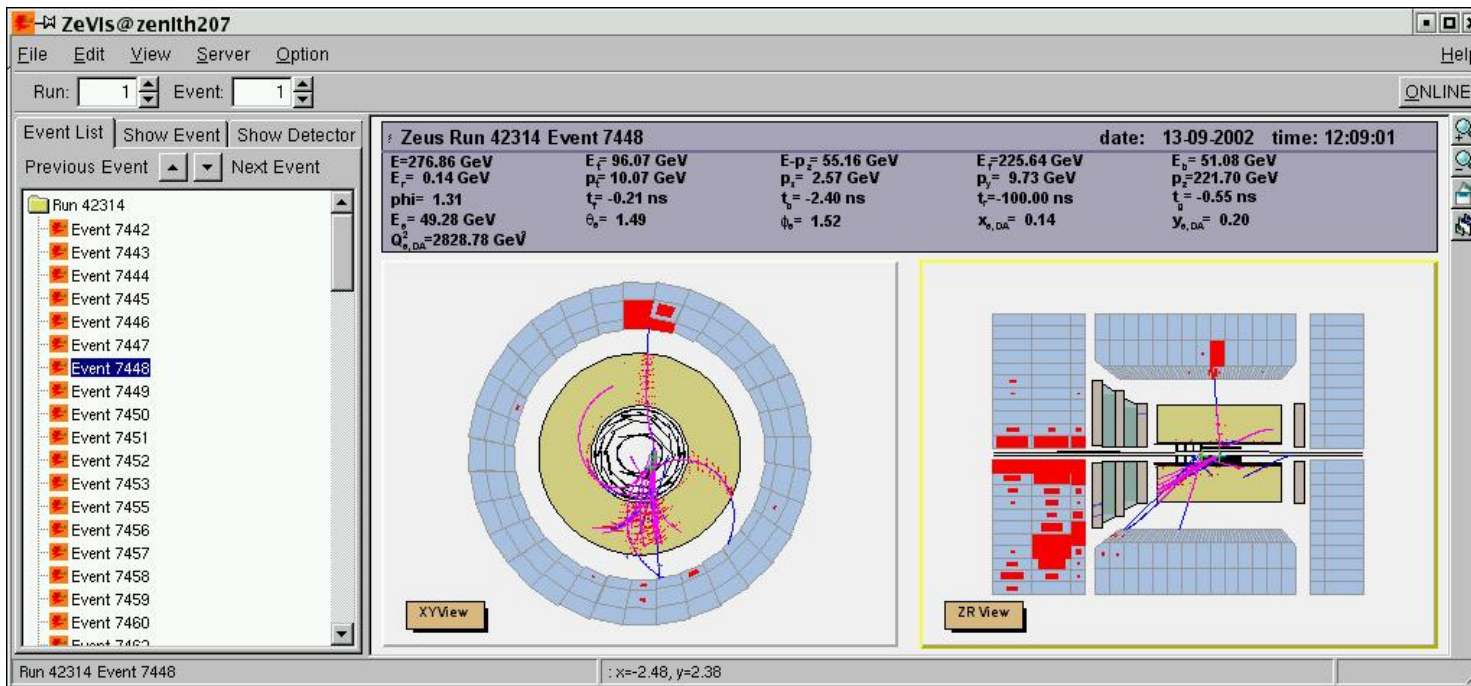




ZeVis



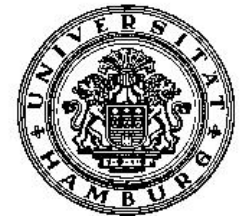
updates and new features



ZEUS Collaboration Meeting, DESY, 14.10.2002

Oliver Gutsche

DESY / ZEUS / University of Hamburg



ZeVis - Team

Crew:

- Oliver Gutsche
- Eileen Heaphy
- Oliver Maria Kind
- Julian Rautenberg
- Rainer Mankel
- Valentin Sipica

former Summer Students:

- Aleksandra Adametz
- Ildar Tamendarov

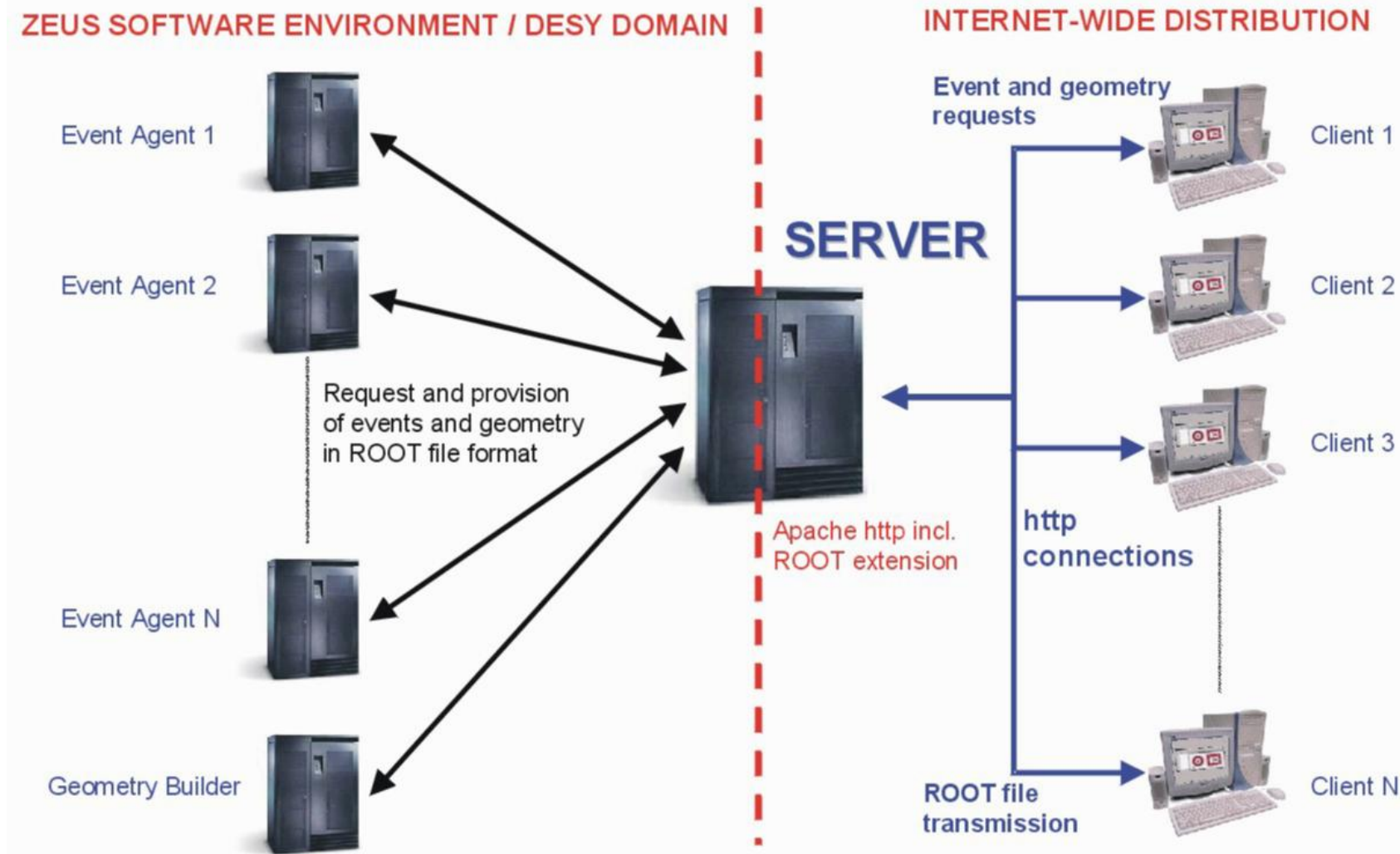
new members:

- Chiara Genta

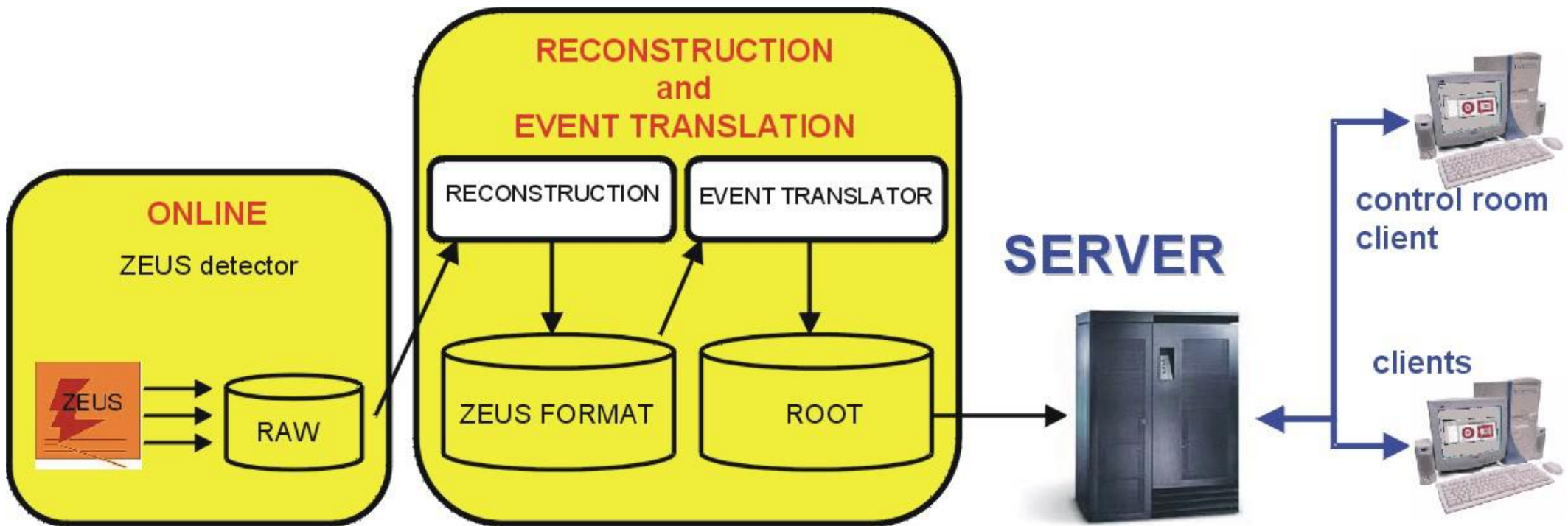
Outline

- Concepts
- Geometry \Rightarrow see talk of Valentin Sipica
- Event information
 - Vertex
 - Tracking
 - Header
- Client
 - next - previous - event functionality
 - printing and picture saving
 - editor
 - color schemes
 - Server dialog windows
- Development-Version
- Online Display
- Summary and Outlook

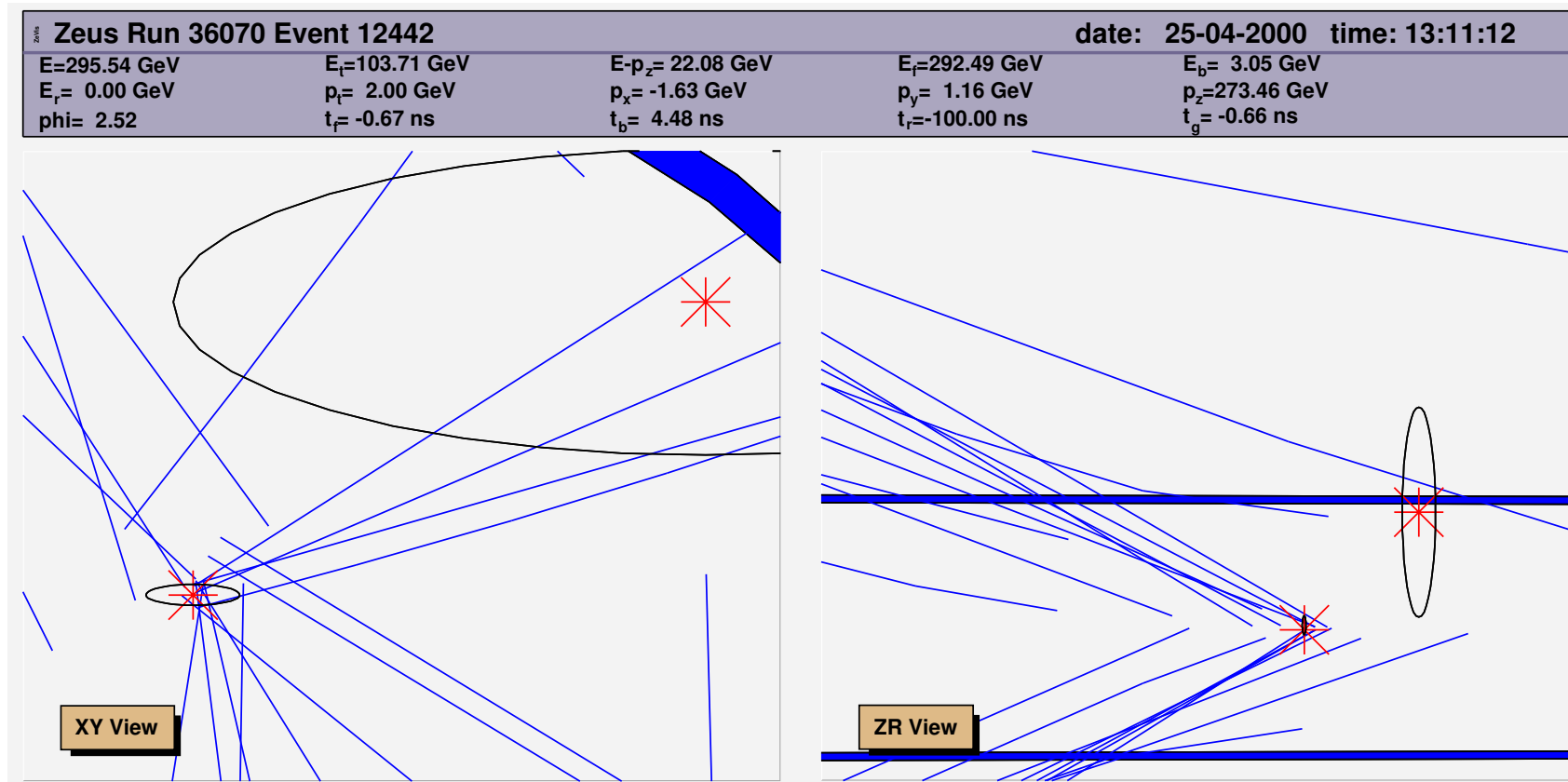
Client-Server-Concept



Online-Display-Concept



Event information: vertex



Informations for vertices are taken from:

primary vertices: **VCTVTX**

secondary vertices: **VCVTXSEC**

Error ellipses are calculated from covariance matrices
errors in x,y and z are taken as axis of ellipses in pro-
jections

Error ellipses are **switched off by default** and have to be activated in “View Menu” under “Vertex”

Event information: Tracking

Status:

available Track categories:

VCTRHL - ctd only tracks (blue)

ZTPRHL - MVD & CTD tracks (pink)

ZTTRHL - Kalman filter tracks (pink)

Update:

all track categories determine start and end point from table members **phiInner** and **phiOuter**

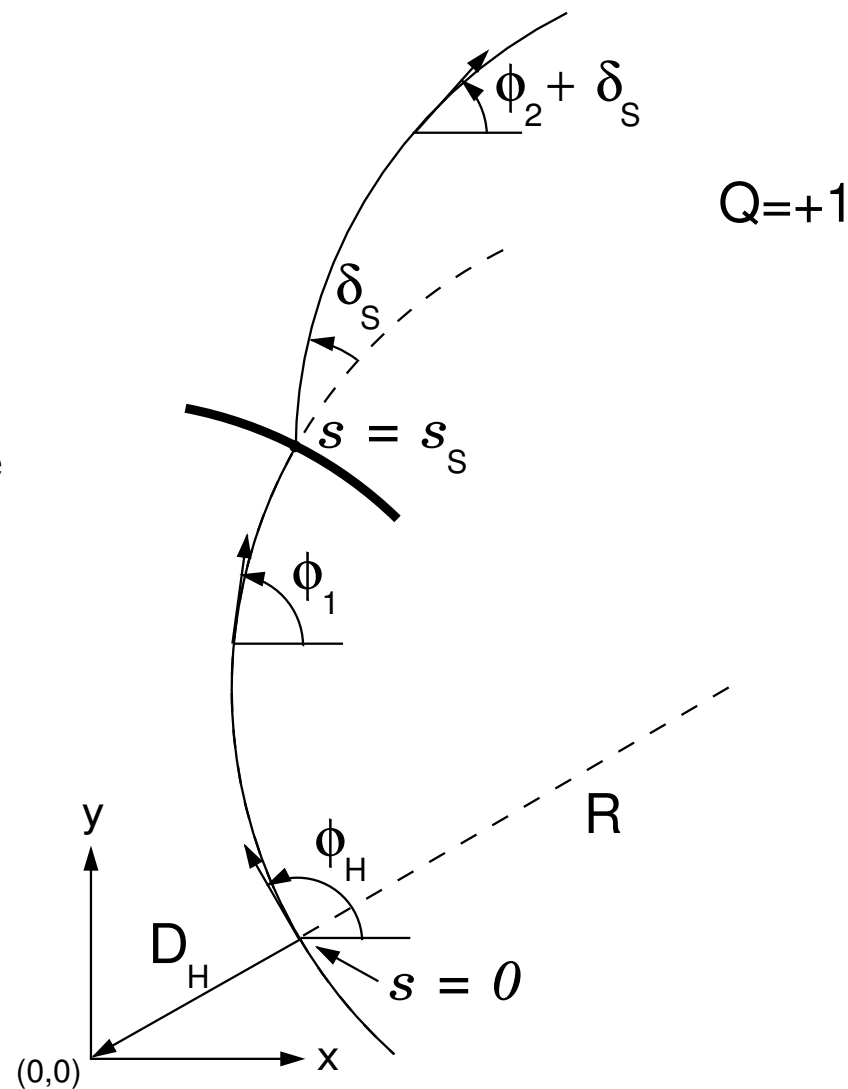
⇒ **checking is needed** for

- provide start and end points of angles are not filled
- correct start and end points for unphysical positions
- correct end points for never reaching any borders

In general:

starting point is not set to phiInner

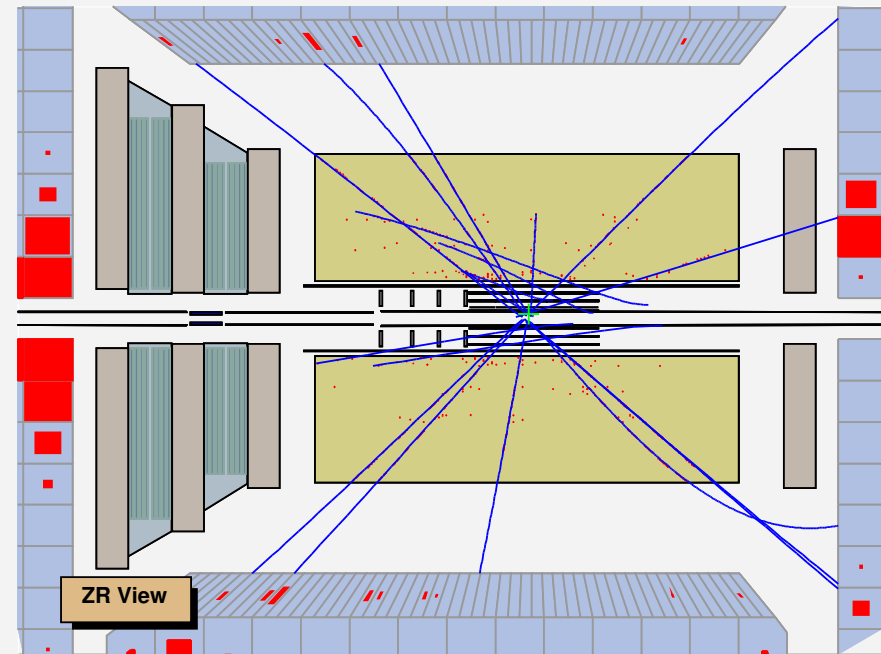
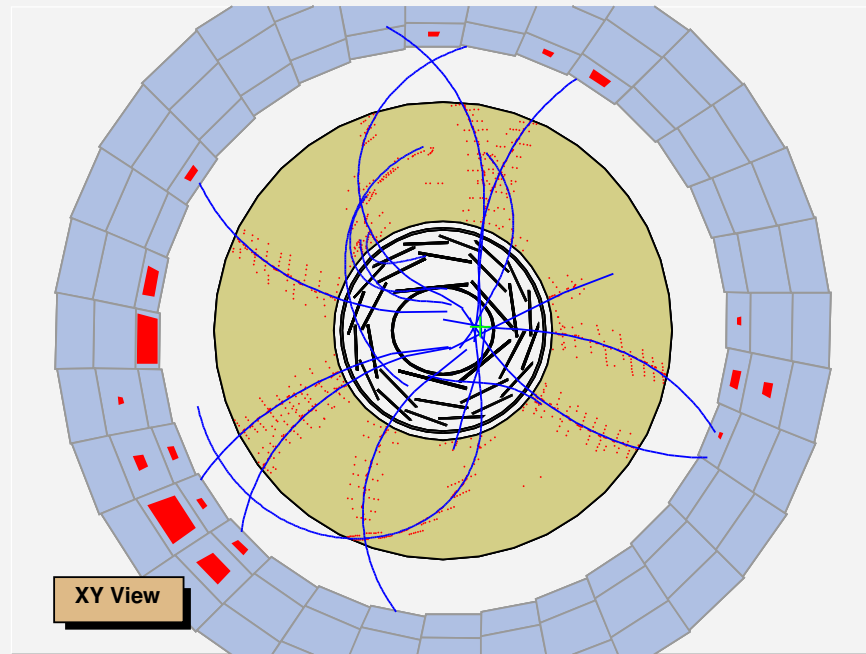
tracks are drawn from helix startpoint ($S = 0$)_s



Event information: VCTRHL restrictions

- starting point
- z restricted between inner forward and inner rear calorimeter edge
 - r restricted to radii smaller than inner barrel calorimeter radius
- end point
- r restricted to radii smaller than inner barrel calorimeter radius
 - z restricted between inner forward and inner rear calorimeter edge

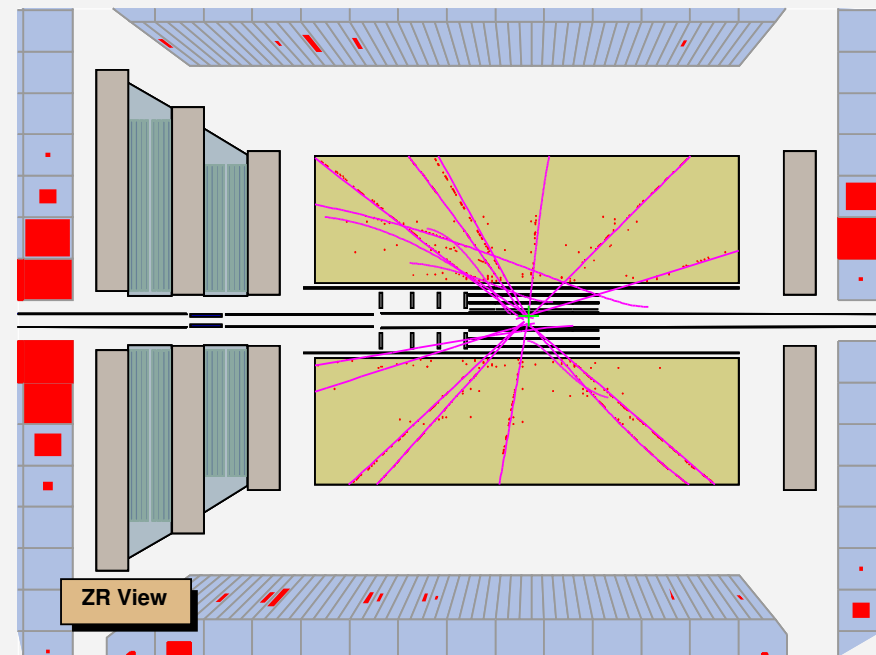
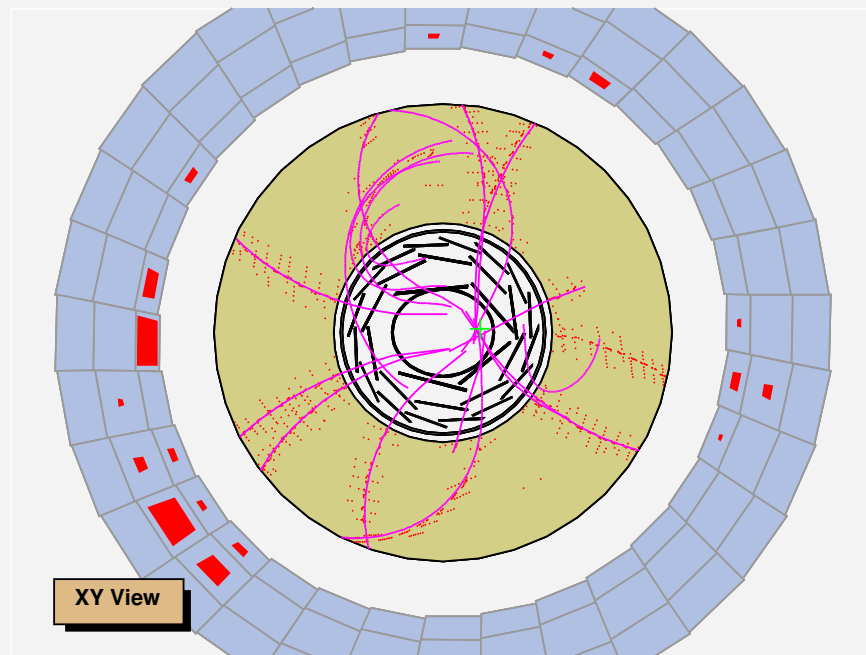
Zeus Run 41996 Event 1522			date: 18-08-2002 time: 06:51:56	
$E=119.62$ GeV	$E_i= 24.02$ GeV	$E-p_z= 46.14$ GeV	$E_f= 88.65$ GeV	$E_b= 10.21$ GeV
$E_r= 20.76$ GeV	$p_i= 0.56$ GeV	$p_x= -0.11$ GeV	$p_y= 0.55$ GeV	$p_z= 73.48$ GeV
$\phi_i= 1.77$	$t_i= -0.23$ ns	$t_b= -0.26$ ns	$t_r= -0.45$ ns	$t_g= -0.27$ ns
$E_e= 18.82$ GeV	$\theta_e= 2.85$	$\phi_e= 0.26$	$x_{e,DA}= 0.00$	$y_{e,DA}= 0.36$
$Q_{e,DA}^2= 41.55$ GeV ²				



Event information: ZTPRHL restrictions

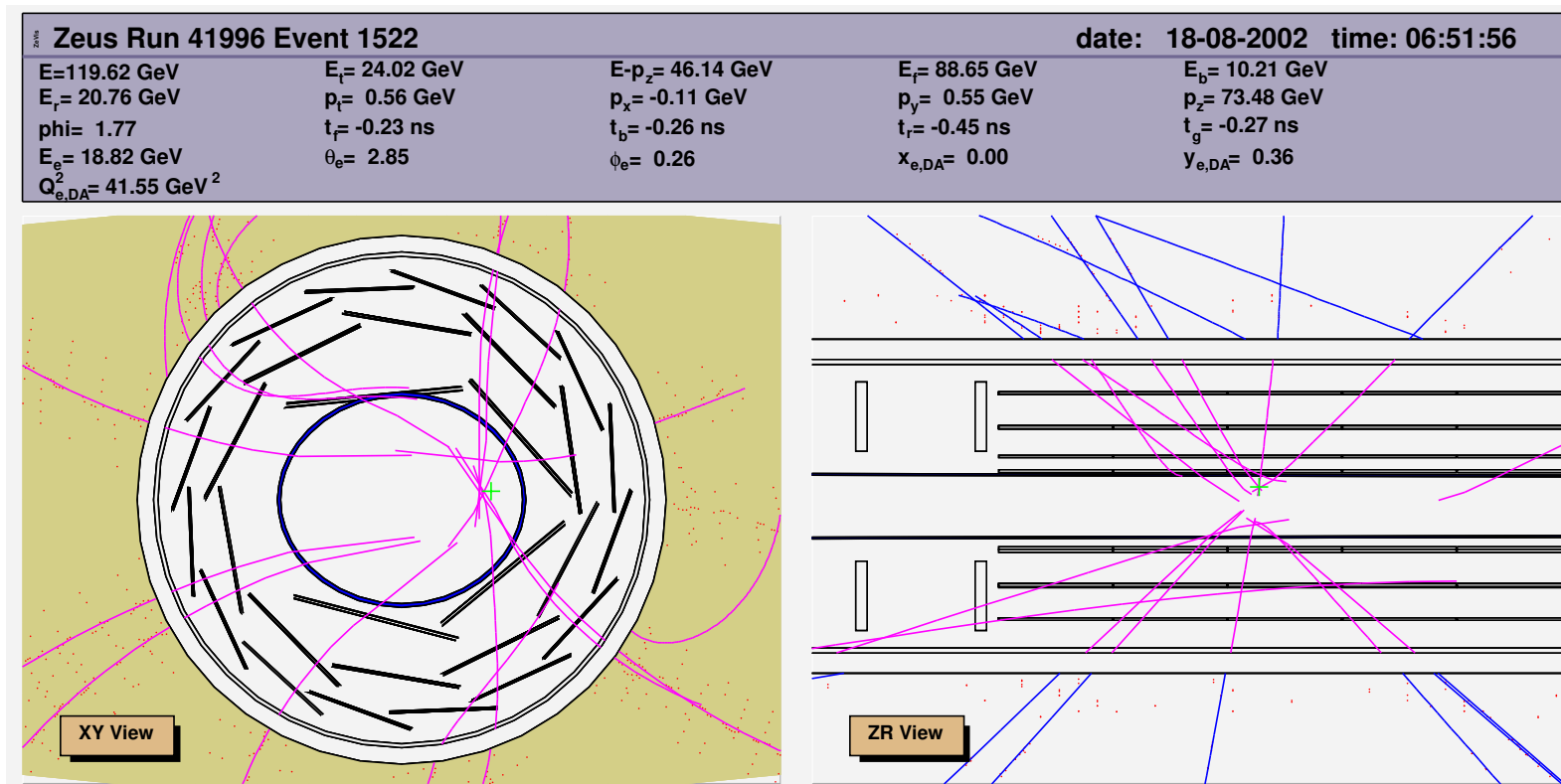
- starting point - z restricted between forward and rear CTD edge
- r restricted to radii smaller than outer CTD radius
- end point - r restricted to radii smaller than outer CTD radius
- z restricted between forward and rear CTD edge

Zeus Run 41996 Event 1522			date: 18-08-2002 time: 06:51:56		
$E=119.62$ GeV	$E_i= 24.02$ GeV	$E-p_z= 46.14$ GeV	$E_f= 88.65$ GeV	$E_b= 10.21$ GeV	
$E_r= 20.76$ GeV	$p_i= 0.56$ GeV	$p_x= -0.11$ GeV	$p_y= 0.55$ GeV	$p_z= 73.48$ GeV	
$\phi_i= 1.77$	$t_i= -0.23$ ns	$t_b= -0.26$ ns	$t_r= -0.45$ ns	$t_g= -0.27$ ns	
$E_e= 18.82$ GeV	$\theta_e= 2.85$	$\phi_e= 0.26$	$x_{e,DA}= 0.00$	$y_{e,DA}= 0.36$	
$Q_{e,DA}^2= 41.55$ GeV ²					



Event information: ZTTRHL restrictions

- starting point - z restricted between forward FMVD and rear BMVD edge
- r restricted to radii smaller than outer MVD radius
- end point - r restricted to radii smaller than outer MVD radius
- z restricted between forward FMVD and rear BMVD edge



shown here: switched of VCTRHL & ZTPRHL in MVD region to show ZTTRHL

Event information: Extrapolation for VCTRHL

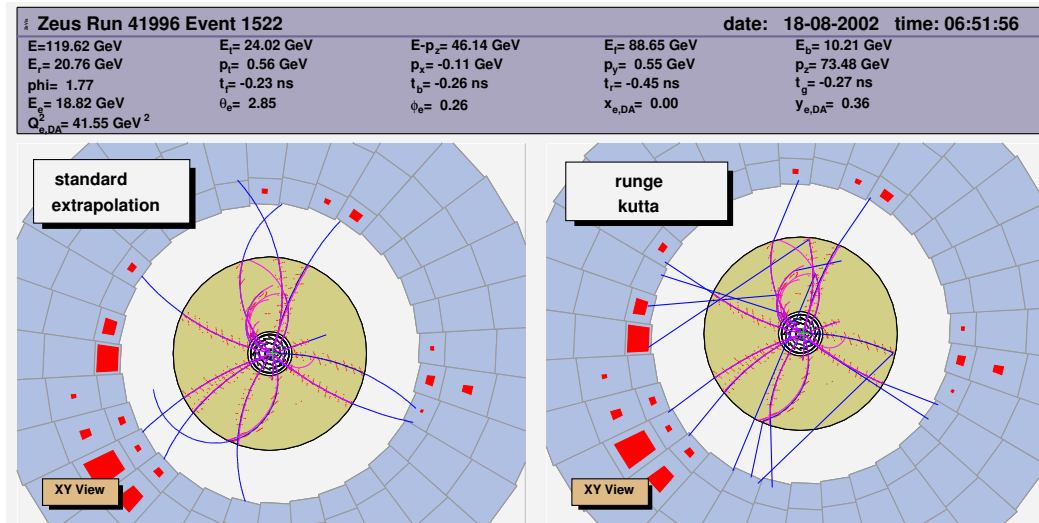
Status:

VCATCAL gives **Runge-Kutta extrapolation** to CAL, endpoint is given in **X,Y,Z** track end point and VCATCAL position is connected with **straight line**
⇒ not completely reliable, sometimes strange behaviors

Update: additional, standard extrapolation scheme

VCATCAL information used to determine if Track can be extrapolated to forward, barrel or rear CAL
helix of track is **extended** to determined CAL part

additional requirement: track from inner border of CTD to end point of track longer than extended track from end point to outer ctd border



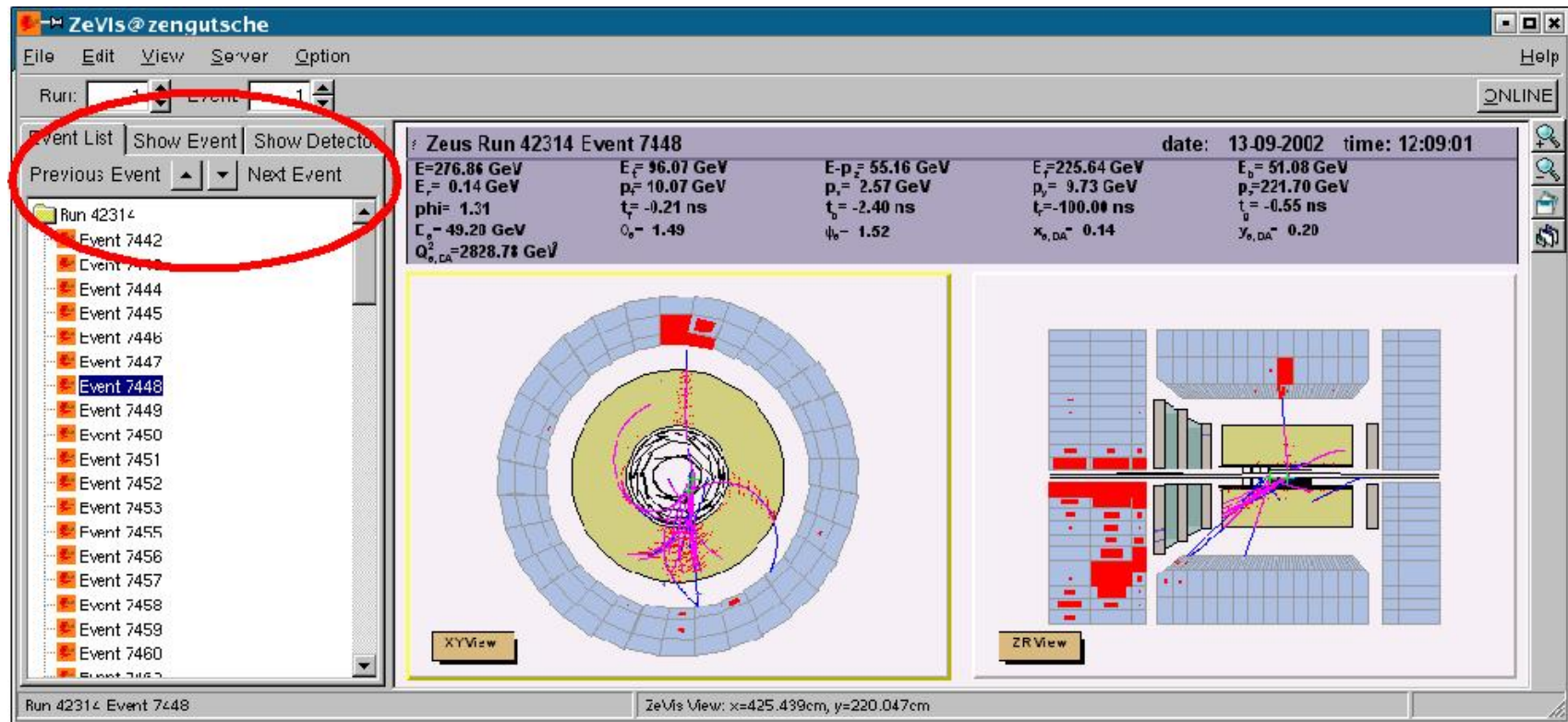
Event information: Header

work by 2002 summer student: [Aleksandra Adametz](#)

Zeus Run 42314 Event 7448				date: 13-09-2002 time: 12:09:01	
E=276.86 GeV	$E_{\bar{r}}=96.07$ GeV	$E-p_z=55.16$ GeV	$E_{\bar{r}}=225.64$ GeV	$E_b=51.08$ GeV	
$E_r=0.14$ GeV	$p_{\bar{r}}=10.07$ GeV	$p_r=2.57$ GeV	$p_y=9.73$ GeV	$p_z=221.70$ GeV	
phi= 1.31	$t_{\bar{r}}=-0.21$ ns	$t_b=-2.40$ ns	$t_{\bar{r}}=-100.00$ ns	$t_{\bar{v}}=-0.55$ ns	
$E_b=49.28$ GeV	$\theta_b=1.49$	$\phi_b=1.52$	$x_{b,DA}=0.14$	$y_{b,DA}=0.20$	
$Q_{b,DA}^2=2828.78$ GeV ²					

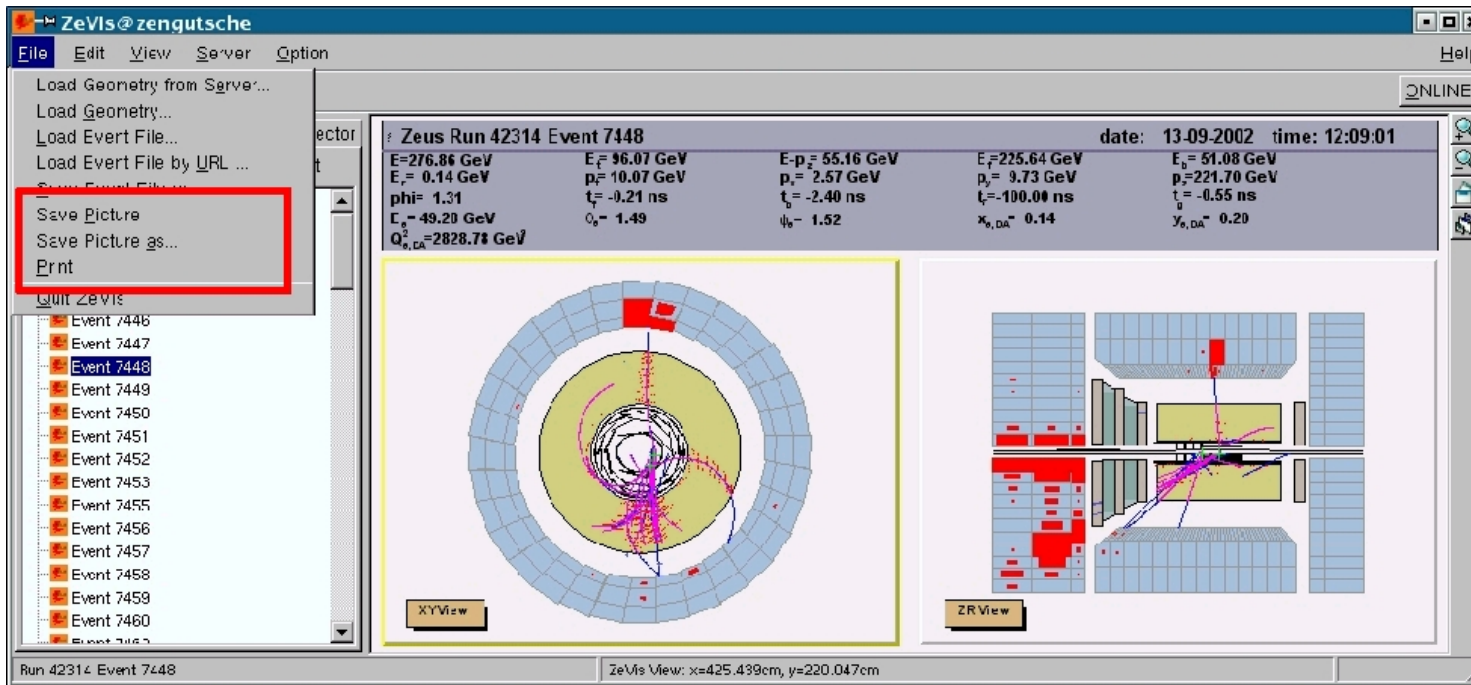
- Update:
- included **ORANGE** calorimeter information
 - included **ORANGE Sinistra** information for three methods (DA,EL,JB) (selectable)
 - included decoded **FLT trigger bits**
 - **header size adjusts itself** for changes in content number and window size

Client: next / previous event



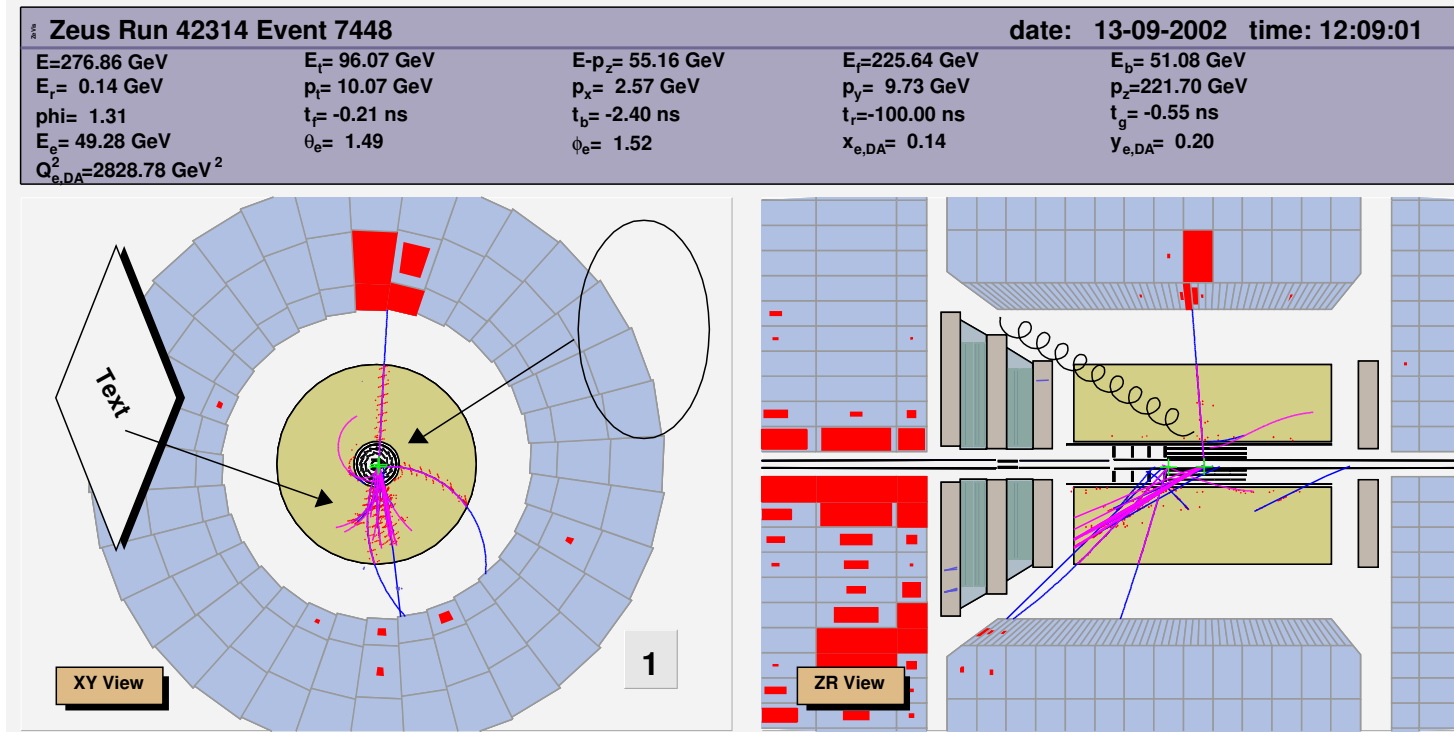
- next and previous event buttons above event list
- key short cuts if mouse cursor is over canvas
 - next: n,N
 - previous: p,P

Client: printing & picture saving



- **printing**: change of default printer possible in Options-Menu
- **picture saving**: two modes
 - I. **quick**: prompted for standard picture type if not defined, picture is saved as **rXXXeXXX.[standard picture type]**
 - II. **interactive**: user prompted for filename plus picture type as extension by **dialog box**

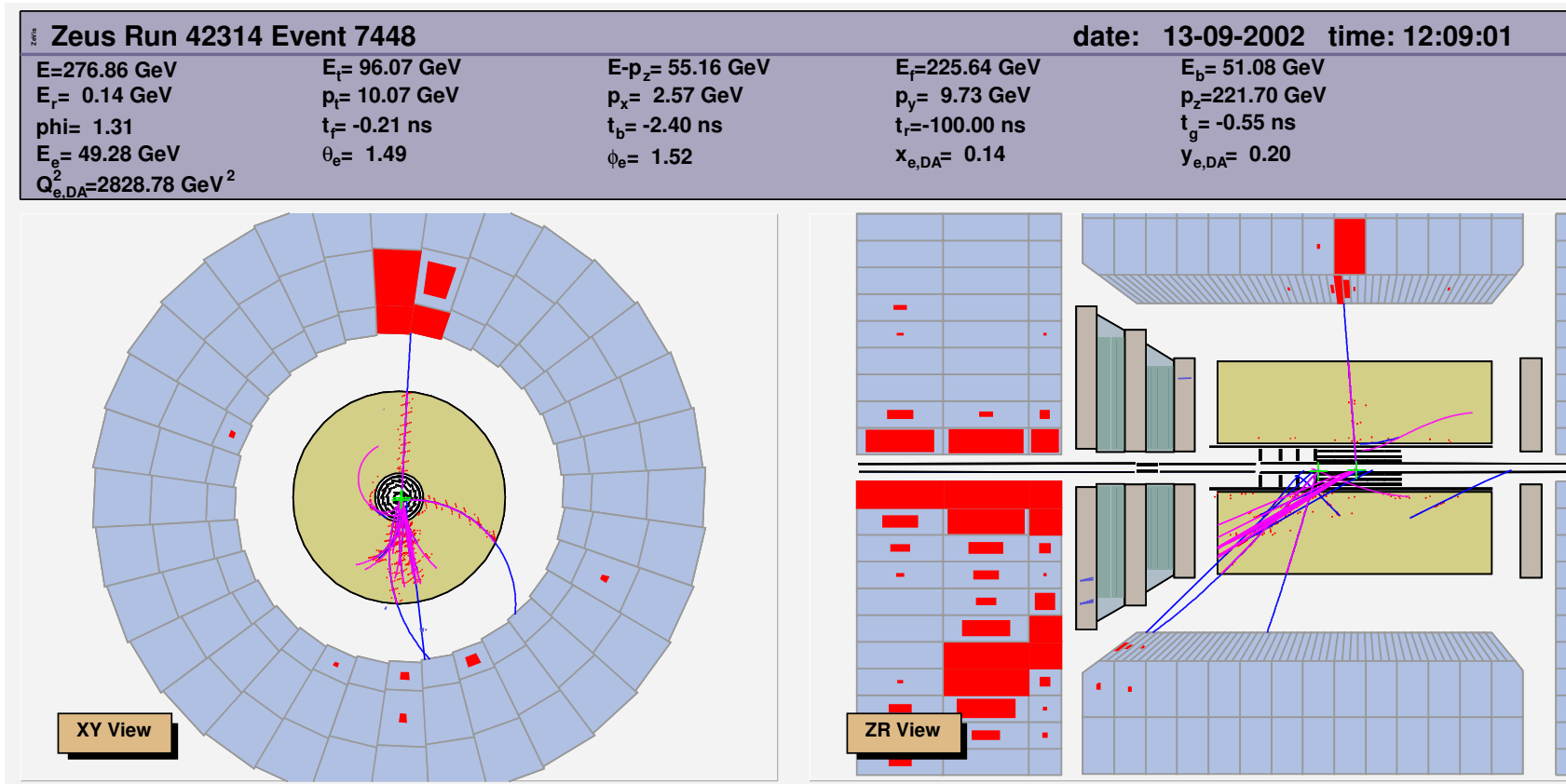
Client: Editor



- integrated editor allows to paint on canvas, e.g.
 - arrows
 - boxes
 - text
 - buttons / markers
- edited pictures are saved to picture files

Color Management

NEW COLORS



NEW COLORS

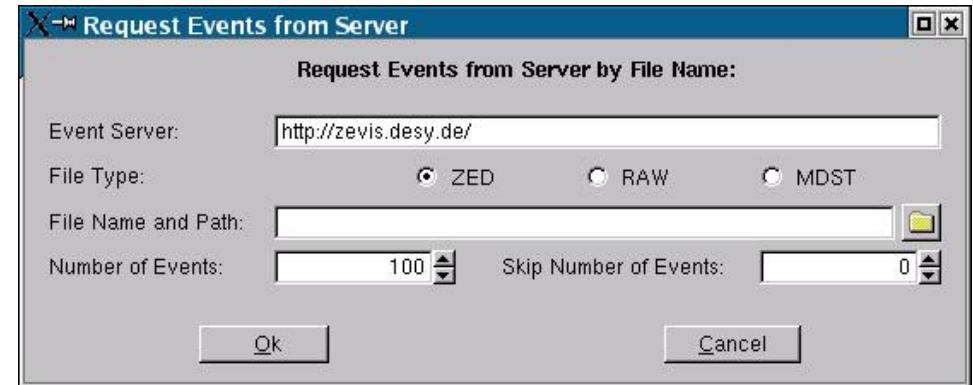
first implementation of **central color management**, **not activated** right now

- flexible change of color schemes
- pre-defined and user-defined color schemes

Client: Server dialog windows

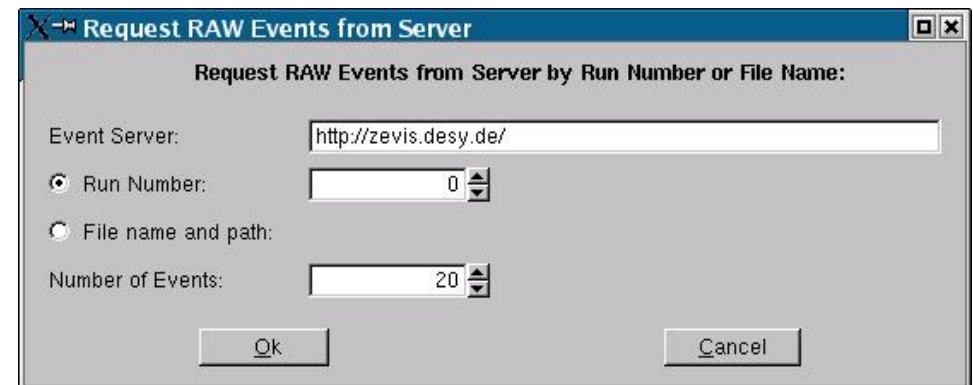
download files from server (z2root on server side)

- give **type** of file to be converted
- give **filename** or browse if ZeVis runs on workgroup server
- give **number of events** and **skip events** to be converted



request **on-the-fly reconstructed raw events** from server

- give **run number** of events to be reconstructed and converted
- alternative give **raw-event filename** or browse if ZeVis runs on workgroup server
- give **number of events** to be reconstructed and converted and give **events to be skipped** before



Development Version

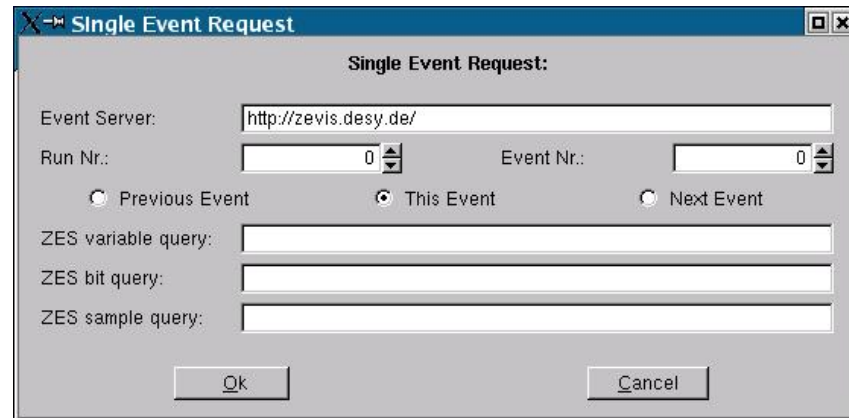
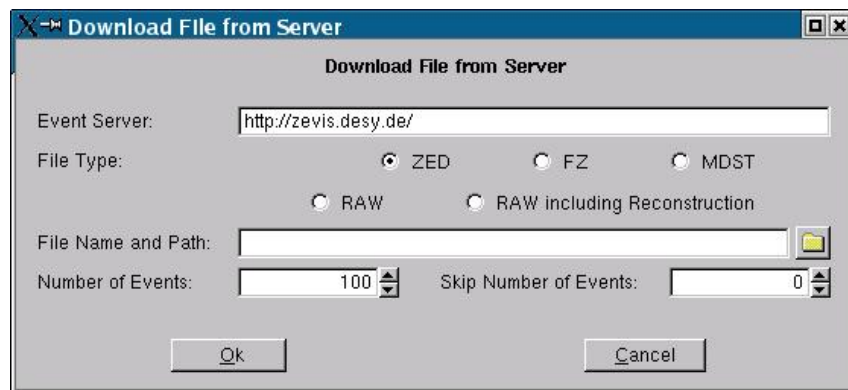
in parallel to ZSMSM release (zevis, z2root, raw2root)

special **zevis release** (zevis-dev, z2root-dev, raw2root-dev)

Intention: test for newest features and feedback from power-user

differences to ZSMSM release right now (for more information see <http://www-zeus.desy.de/~zevis/>)

- advanced server functionalities including first implementation of single event server in ZES mode:



- opaque movement in 3D-View in pad

Online Display

in control room:

- online display is running on machine **ZULU18** (big flat-screen)
- only possible login by account **zevon**
- after login, “**only**” the ZeVis client starts in online mode
- **PLEASE, don't use this machine for any other purpose**

on every client:

- same functionalities as in the control room can be accessed by activating the **online mode** in the upper right corner of the client

general remarks:

- **update time** between new events from DAQ chain was **about 2 min**
- reason, **slow old online reconstruction machine**
- currently **moved** online reconstruction **to faster machine**
- **significant decreasing of update time**, now \approx three events per minute or even more, recommended update time: **20 sec**
- update time right now fixed by client to 1 minute, can be changed in option menu

Summary & Outlook

Summary:

- numerous improvements in functionality
- lots of work was also put in non-visible elements of ZeVis like memory management and time consumption of operation
- added new components and new event information

Outlook:

- further integration of missing components
- implementation of color-schemes
- integration of user options via resource-file (.zevisrc)
- changing of geometry according to detector status during recording
- version management for event files

if you have questions, suggestions or complaints

please mail to

zevis@mail.desy.de