

Advanced European Infrastructures for Detectors at Accelerators

DDEve

An Event Display for DD4hep Geometries

- DRAFT -

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Abstract

DDEve is a framework implementing a event display for detector geometries implemented using DD4hep. DDEve hereby takes advantage of the TEve toolkit naturally provided by the ROOT framework like the ROOT geometry toolkit TGeo. DDEve actively uses the collaboration between TEve and TGeo as well as the various object collaborations provided by the toolkits. DDEve does in no way intend to hide any of the two toolkits, but rather provides facilities to construct various detector views in the most suitable manner using predefined configurations.

Document History		
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1 Introduction

Short usage description of DDEve .

DDEve is a purely experimental package. It was developed to

- visually debug developed detector geometries including partial views using predefined displays.
- compensate the frustration caused by the slow progress of subdetector geometry implementers, which did not get up to speed and hence did not require any support from me.....

Since up to now DDEve is a hobby of mine, please do not expect a great deal of documentation and support.

2 Running the CLICSiD Example

DDEve is started using the root executable. In the following we describe how to start a display application of DDEve using the CLICSiD example.

\$> root.exe \$DD4hepINSTALL/examples/DDEve.C

When the command is issued the following display shows up:

🗴 😑 🗉 Eve Main Window		
🛞 Need to choos setup file		
No DDEve setup given. You need to choose now If you need an example, open examples/CLIDEid/eve/DDEve.xnl and the corresponding event data examples/CLIDEid/eve/CLICSID_Events.	cene Viewer 1	Actions
Bismiss Style Guides Guides Clipping Extras Guides Clipping Extras 5000 ± Hax 100 ± Class Clop Fight Fight Ø Top Ø Bottom Ø Front Ø Specular		
Point-size scale: 1.V V	nand	-
		11.

Figure 1: The DDEve startup view.



Click on "Dismiss" then the file browser opens and you have to select a DDEve configuration file:

x - D Eve Main Window			
🛞 Open			
Look in: 🔄 eve	💌 🗈 🏕 🧱 🎹 🗖 Multiple files	Viewer 1	Actions
DDEve.xml			
File name: DDEve.xml Files of type: xml files (*.x	(ml) Cancel		
Files of cgpe; JXMI files (*,x	Cancer		
VV	- >		
Style Guides Clipping Extras			
GLViewer [TGLSAViewer] Update behaviour			
☐ Ignore sizes			
✓ Reset on update	>		
Update Scene Camera Home			
Max HQ draw time: 5000	=		
Max LQ draw time: 100			
Clear Color 🔄 👻			
Light sources: Top Bottom			
🔽 Left 🔽 Right			
🔽 Front 🔽 Specular		vv	
Point-size scale: 1.0	Command Command (local):		
Line-width scale: 1.0 🖨	Lommand (local):		<u> </u>
Wireframe line-width 1.0	•		

Figure 2: The DDEve popup dialog to open the XML configuration file.

Move to the directory DD4hepINSTALL/examples/CLIDSid/eve and open the DDEve configuration file DDEve.xml. The basic idea is that DDEve as an application is truely generic and that all subsequent behavior



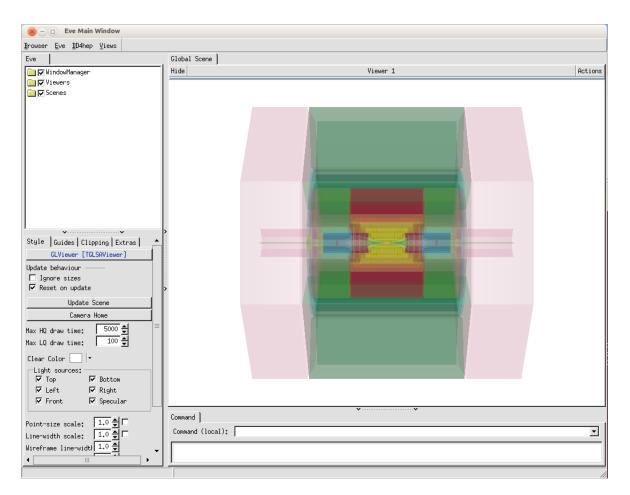


Figure 3: The DDEve default view showing the loaded detector.

Next you should see the default pane with the instantiated CLICSiD detector:



Then open from the "DD4hep" menu the item "Open Event Data". Move again to the directory \$DD4hepINSTALL/examples/CL and open the sample file CLICSiD_Events.root containing a sample of events being the output of a DDG4 simulation step:

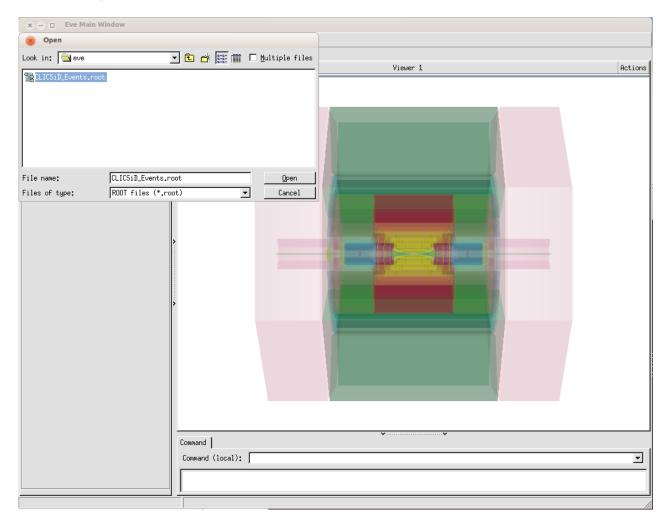


Figure 4: The popup dialog to open event data files.

Using the "Views" menu other predefined detector views may be used.



The "Eve" tab on the pane to the left allows to further customize the predefined views, the Evt I/O tab to control which event should be displayed.

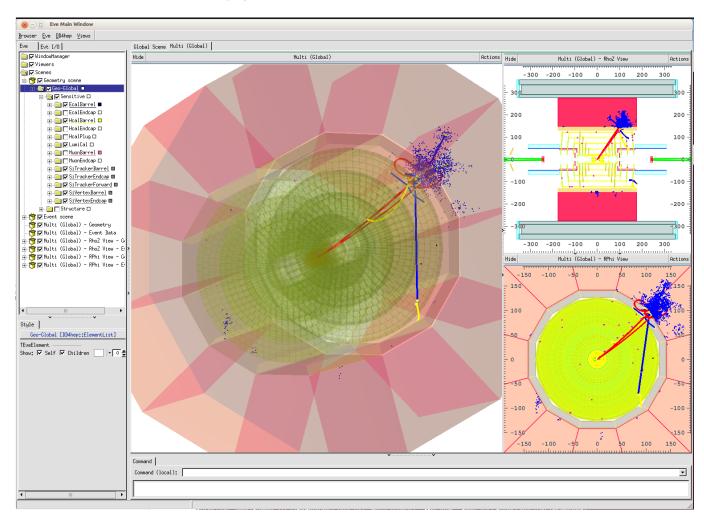


Figure 5: An example of a customized view with sub-panes. Please proceed to the XML configuration file how to create a predefined view.



😠 🗆 🗉 Eve Main Window	
Browser Eve DD4hep Views	
Eve Evt I/0	Global Scene 3D Vertex 3D Trackers 3D Trackers R-Phi (Global) 3D Ecal+Hcal
Event I/O Control	Hide 3D Ecal+Hcal
CLICSiD_Events.root	
Number of events: 10	
Open event file:	
Previous: 🥱 Next: 🧒	
Goto event:	
Event data	
Hit collection name No.Hits	
Coll.Type: Particle	
MCParticles 198	
Coll.Type: SimpleCalorimeter::Hit	
BeamCalHits 0	
EcalBarrelHits 1	
EcalEndcapHits 7	
HcalBarrelHits 108	
HcalEndcapHits 0	
HcalPlugHits 0	
HCalFlugHits 0 LumiCalHits 0	
MuonBarrelHits 0	
MuonEndcapHits 0	
Coll.Type: SimpleTracker::Hit	
SiTrackerBarrelHits 115	
SiTrackerEndcapHits 187	
SiTrackerForwardHits 3	
SiVertexBarrelHits 6	
SiVertexEndcapHits 12	
	Hcal
	Ecal
	Coneard
	Command (local):
H1T/-D	

Figure 6: Calorimetr energy deposits in the ECAL (red) and the HCAL(blue).



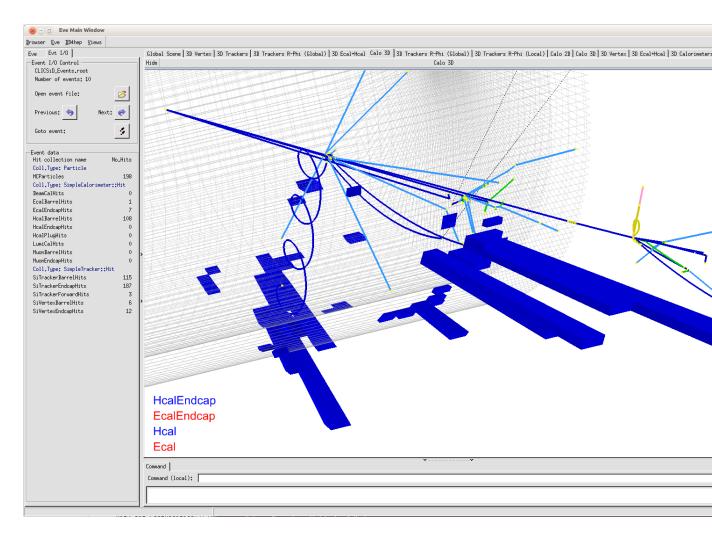


Figure 7: HCAL calorimeter deposits together with Monte-Carlo tracks.

3 View Configuration

This part of the DDEve application is not really stable. to configure displays other than for the CLICSiD example, you have to use the trial and error approach. Starting from the CLICSiD example is not too bad an approach.



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