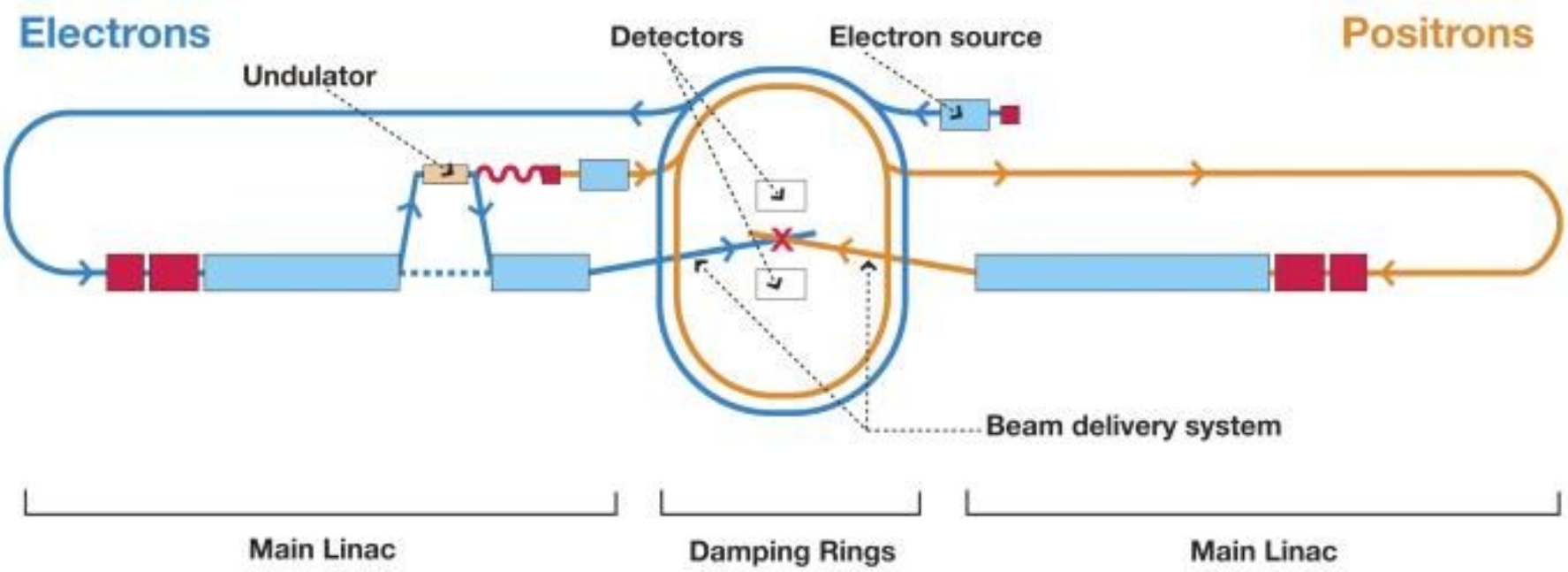
STUDYING THE CHARACTERISTICS OF THE FORWARD CALORIMETER

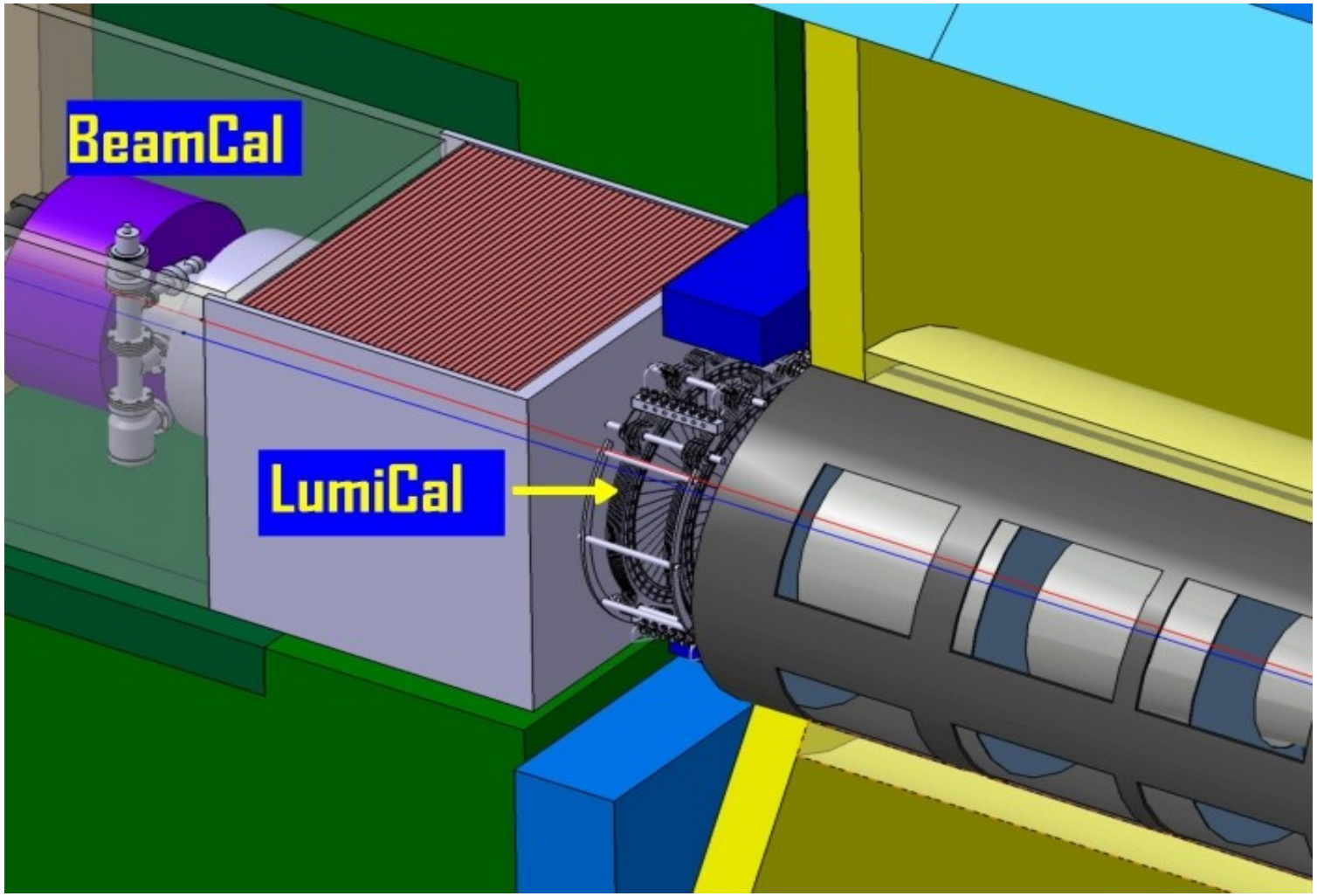
Kedkanok Sitarachu

ILC



www.desy.de

FCAL



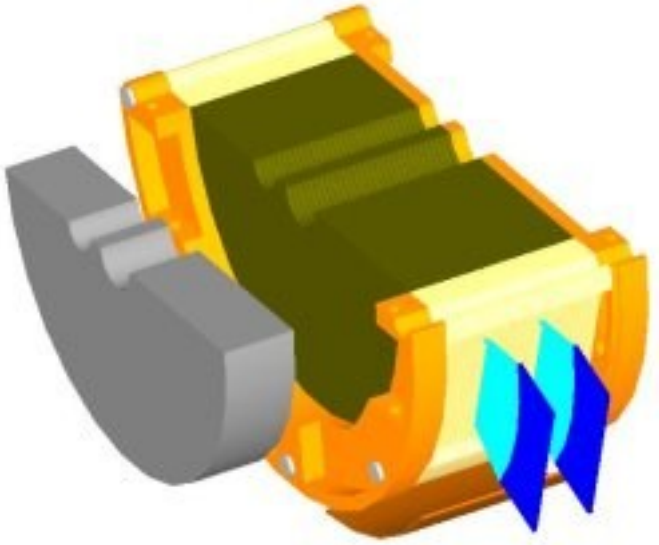
http://fcal.desy.de/

FCAL

- BeamCal
- LumiCal
- Pair monitor

BeamCal

- Measure energy deposition from single high energy electron
- Assist beam tuning
- Protect inner part of detector



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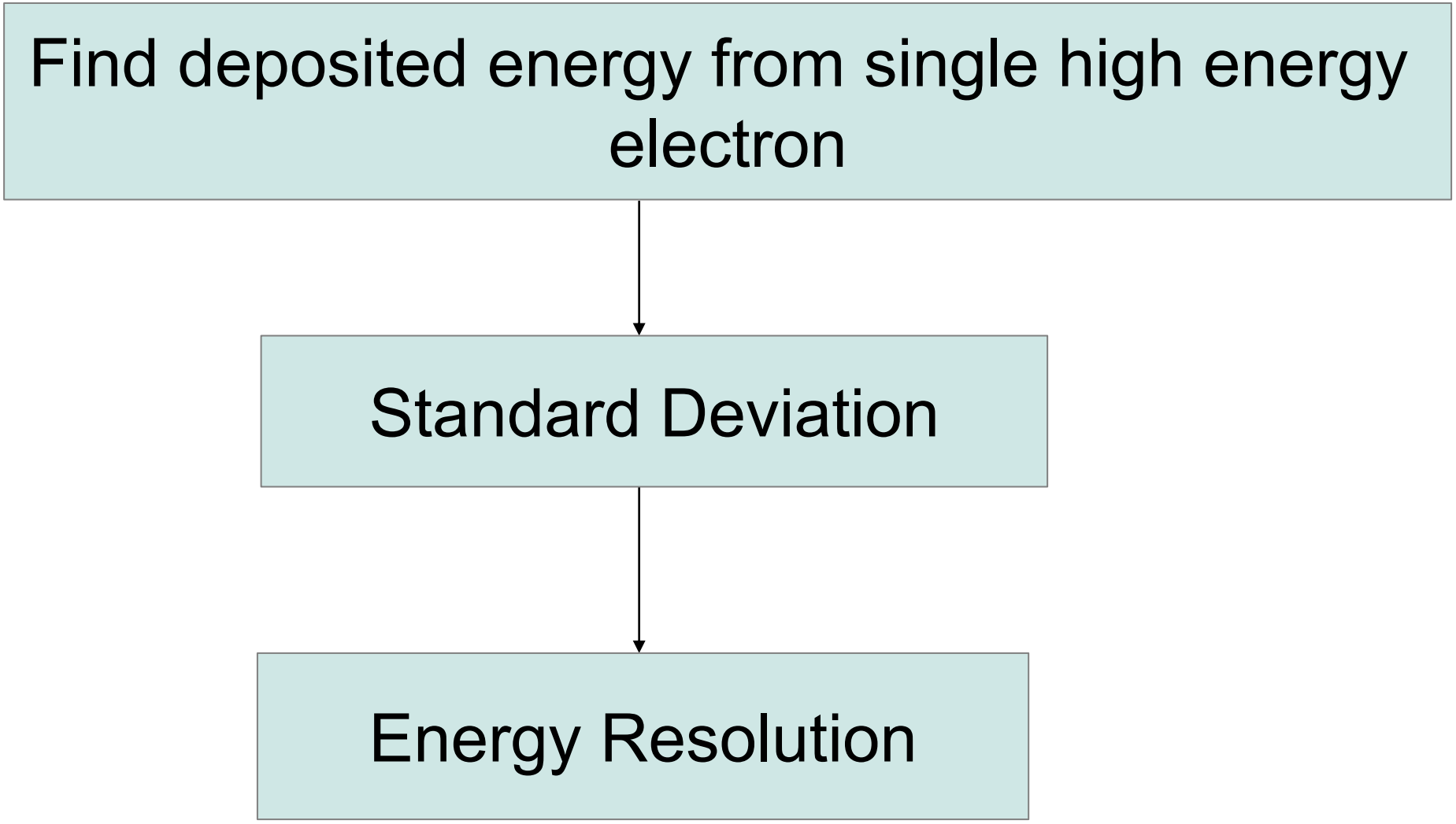
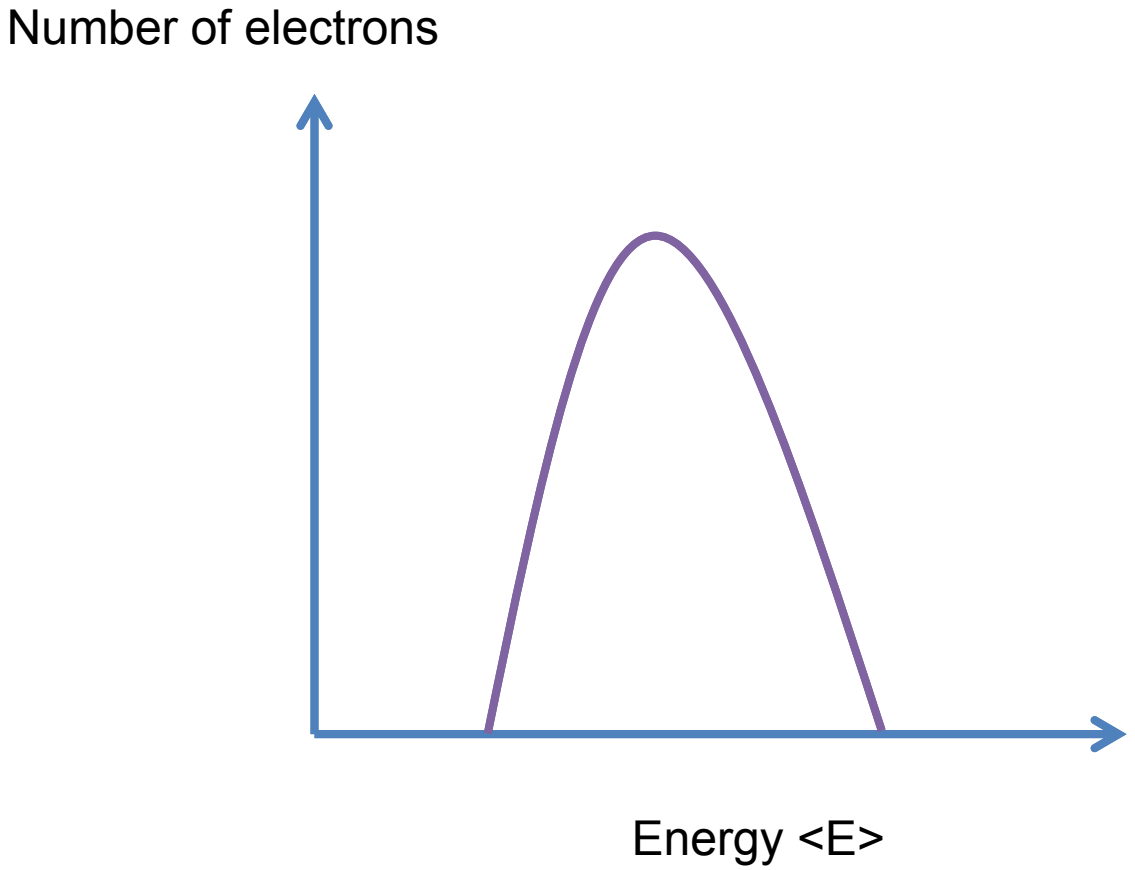
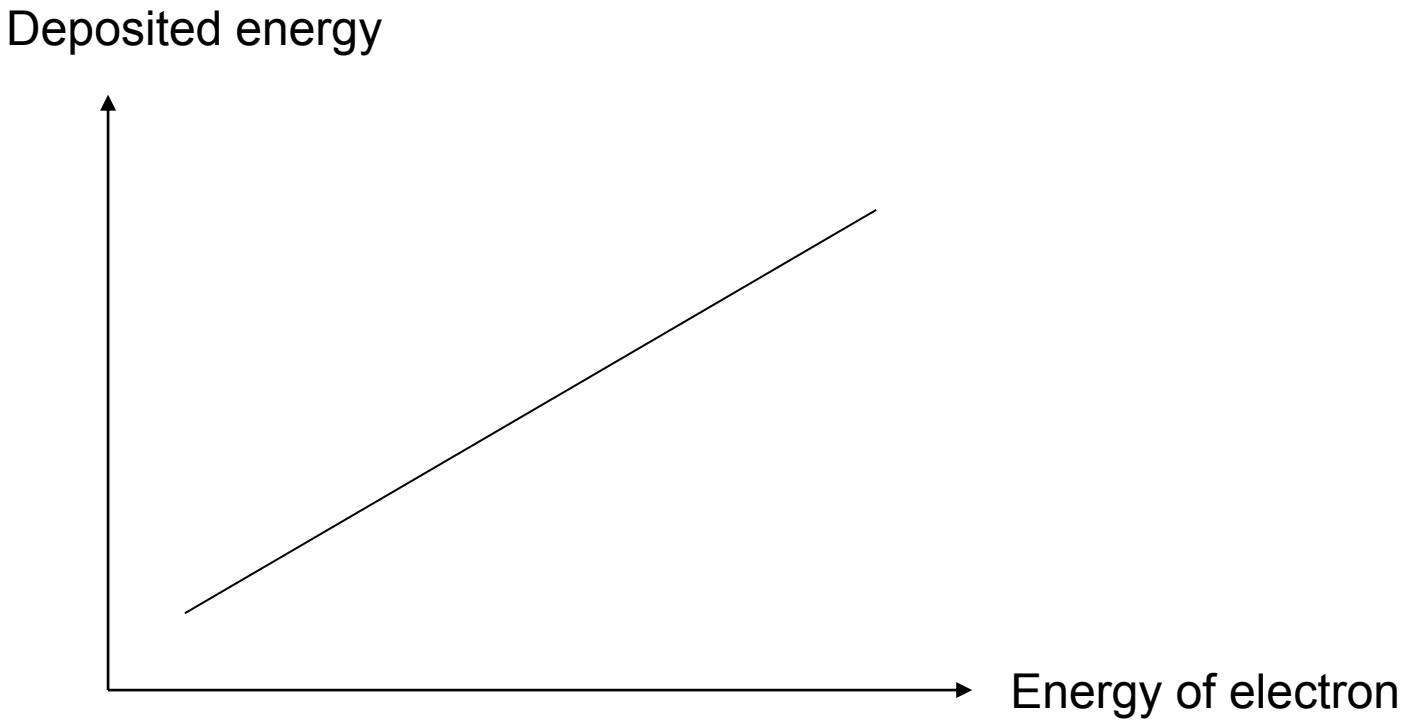
Goal

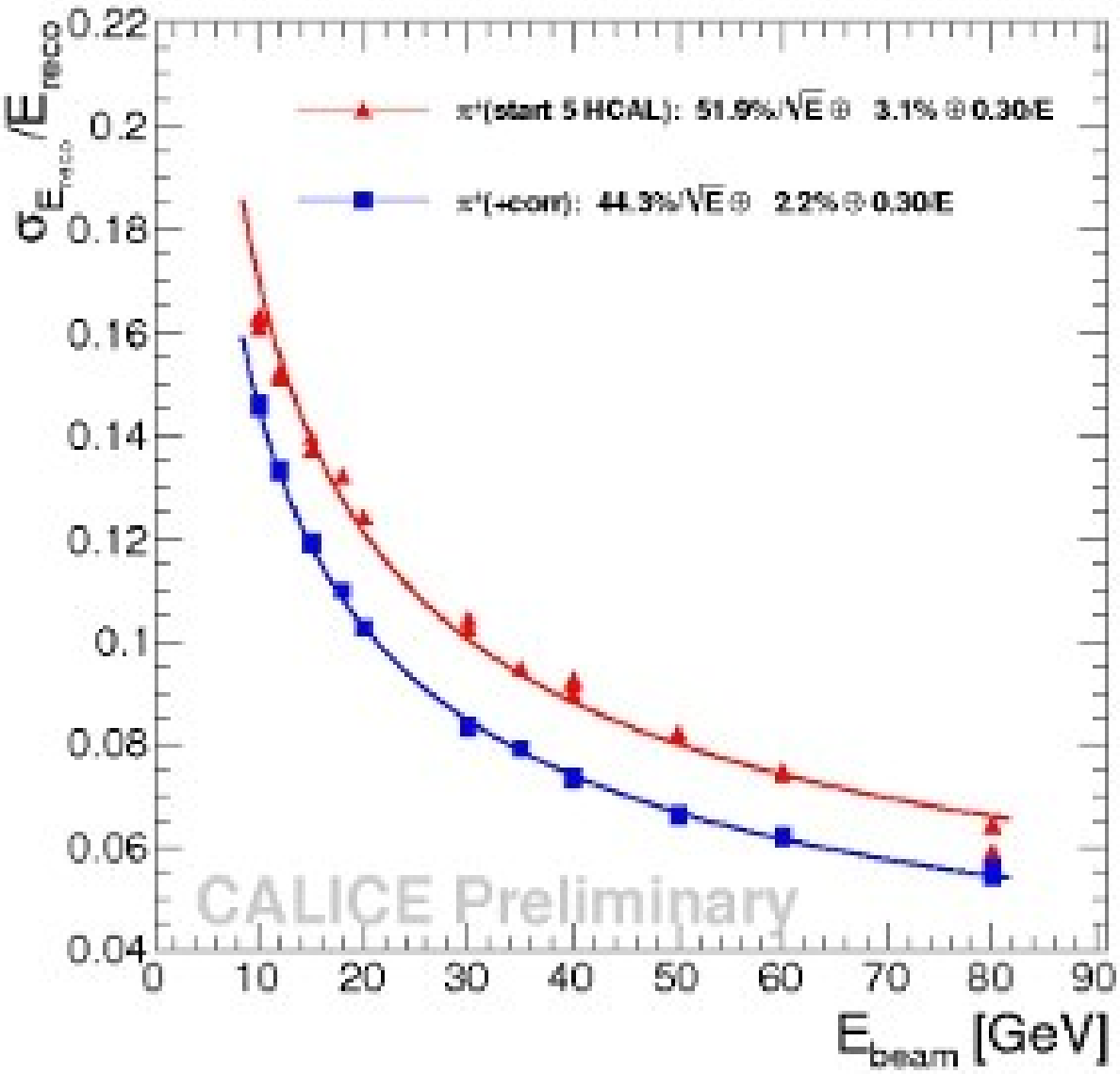
- Find energy resolution

Plan


Find deposited energy from single high energy electron
Standard Deviation
Energy Resolution


Number of electrons
Energy <E>


Deposited energy
Energy of electron



$$\frac{\sigma E}{E} = \sqrt{\frac{a^2}{E} + c^2}$$

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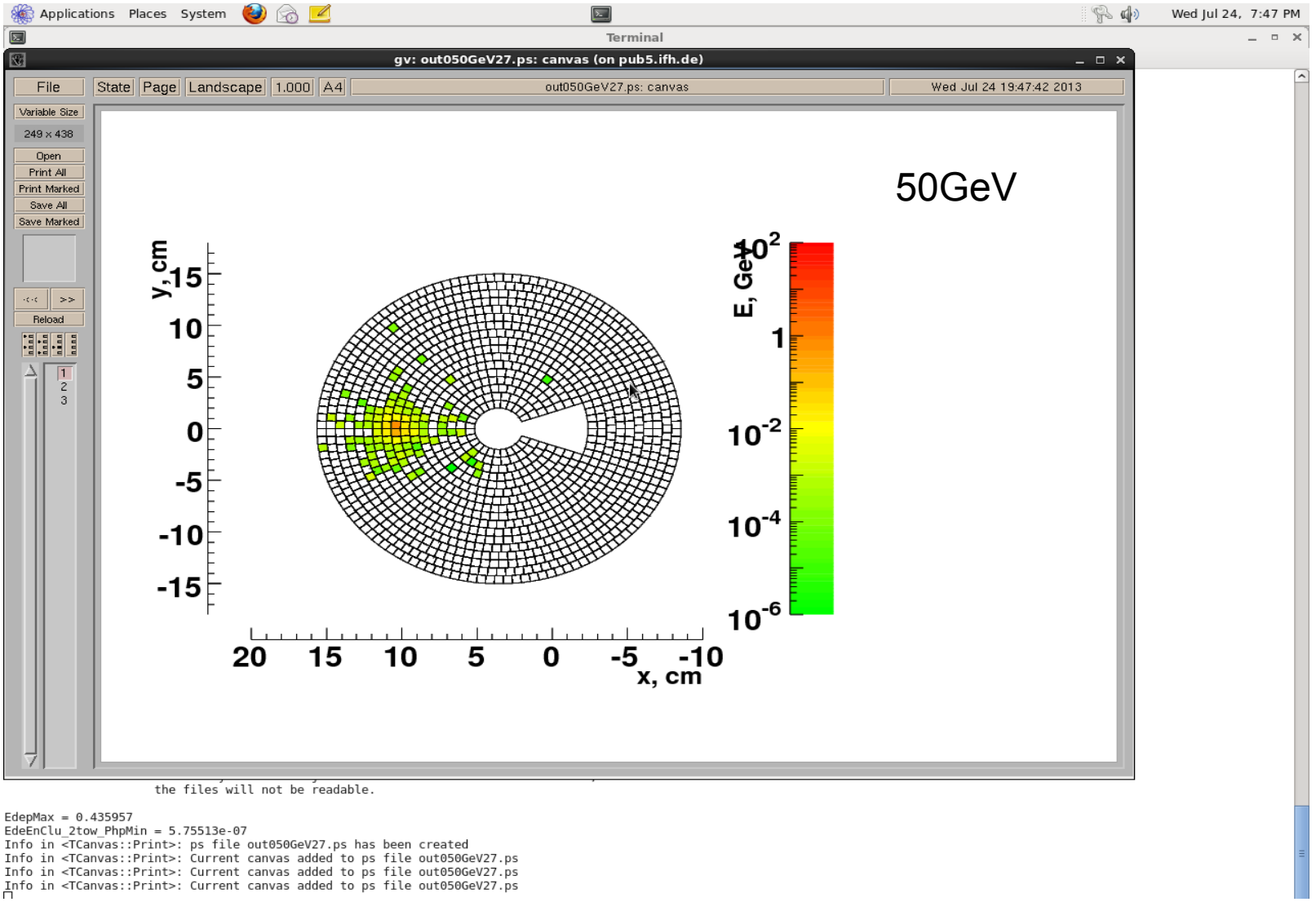
What I have done

- Studied Linux
- Review FCAL
- Studied old data from Lucia
- Planed to get result
- Learned how to write shell script
- Simulated single high energy electron

Results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Wed Jul 24, 7:47 PM
Terminal
gv: out050GeV27.ps: canvas (on pub5.ifh.de)
File State Page Landscape 1.000 A4 out050GeV27.ps: canvas Wed Jul 24 19:47:42 2013
Variable Size
249 x 438
Open
Print All
Print Marked
Save All
Save Marked
Reload
50GeV
y, cm
15
10
5
0
-5
-10
-15
20 15 10 5 0 -5 -10
x, cm
E, GeV
10^2
1
10^{-2}
10^{-4}
10^{-6}
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EdepMax = 0.435957
EdeEnClu_2tow_PhpMin = 5.75513e-07
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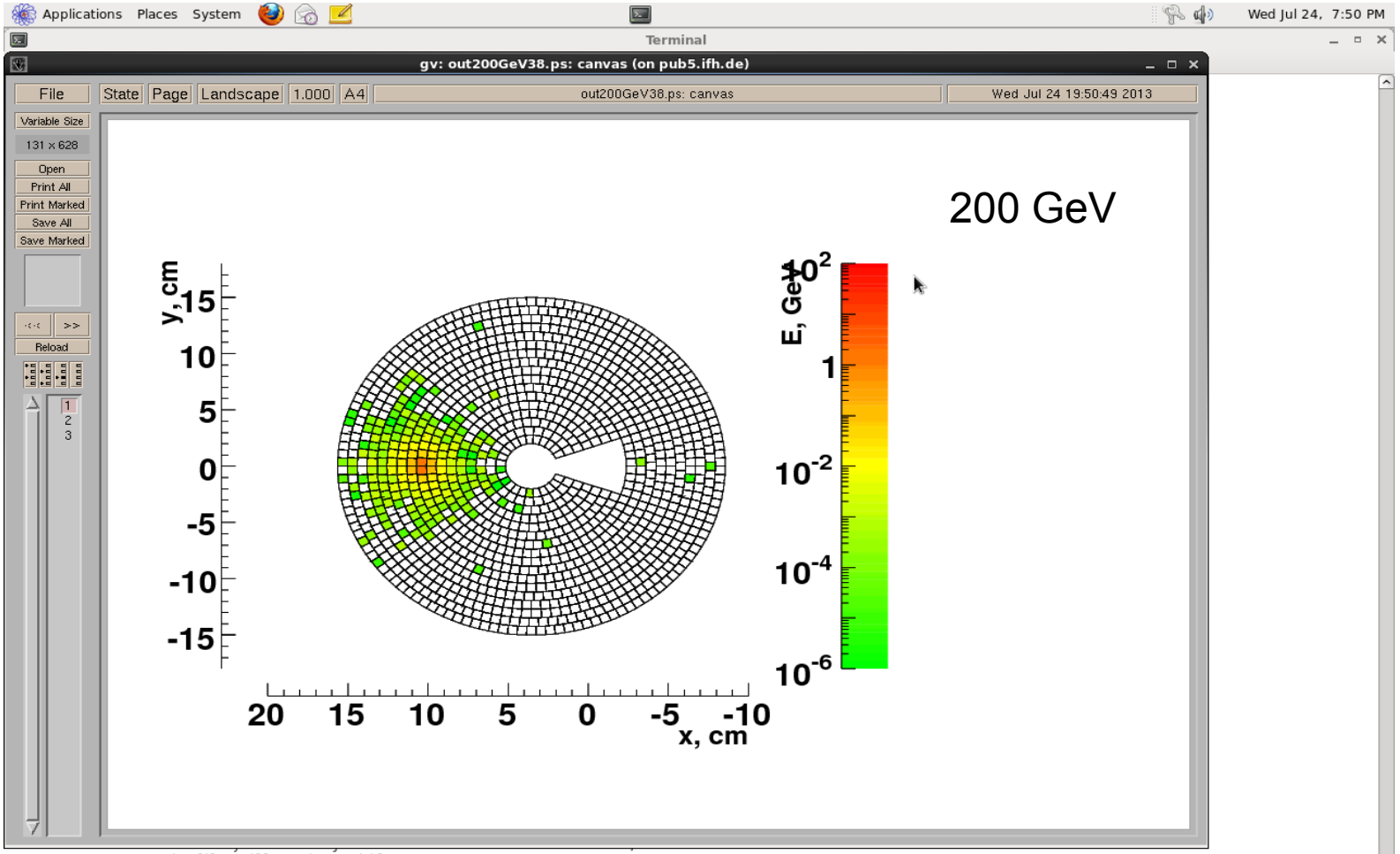
Applications
Places
System
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Terminal
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File
State
Page
Landscape
1.000
A4
out200GeV38.ps: canvas
Wed Jul 24 19:50:49 2013
Variable Size
131 x 628
Open
Print All
Print Marked
Save All
Save Marked
Reload
200 GeV
y, cm
15
10
5
0
-5
-10
-15
20
15
10
5
0
-5
-10
x, cm
E, GeV
10^2
1
10^{-2}
10^{-4}
10^{-6}
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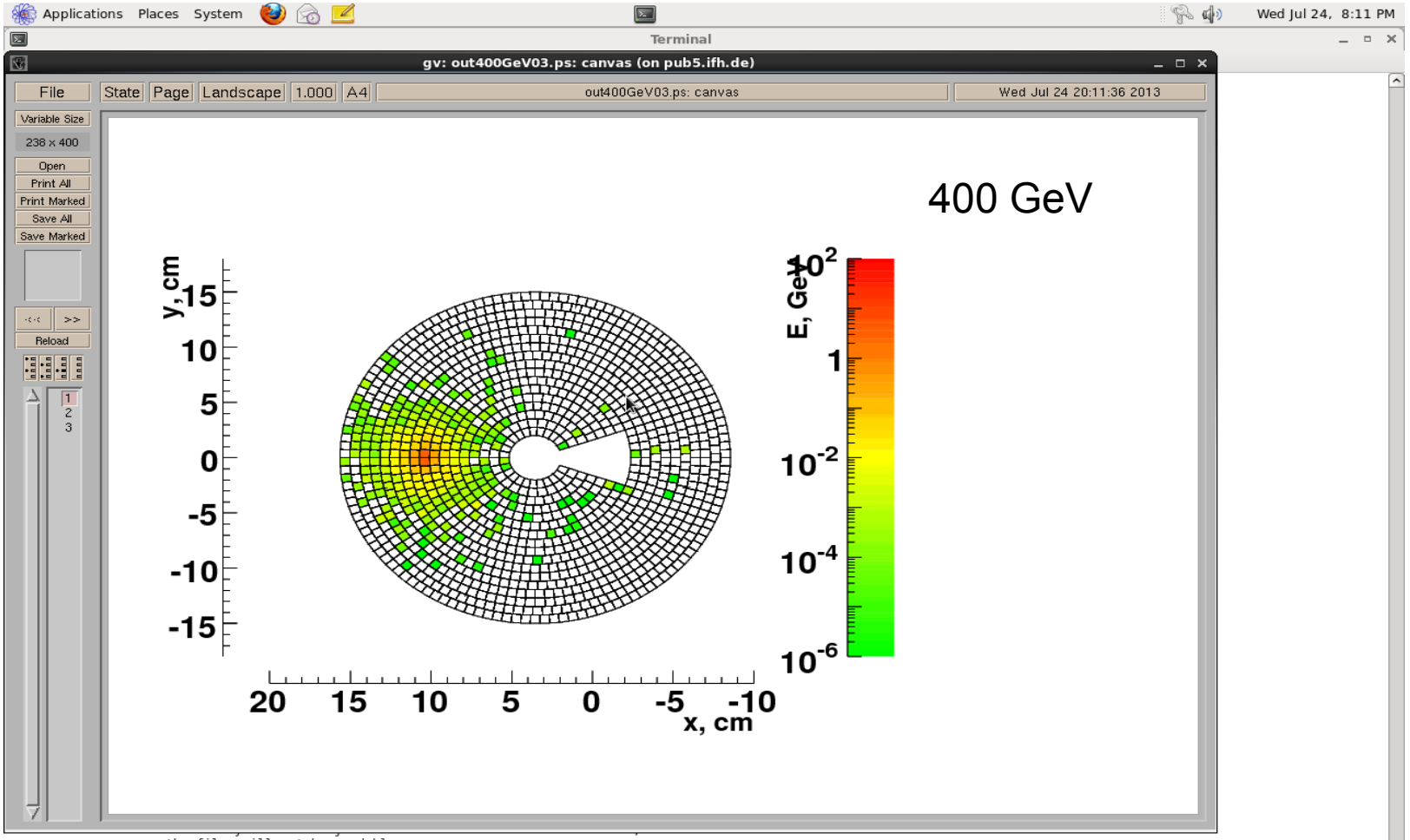
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File
State
Page
Landscape
1.000
A4
out400GeV03.ps: canvas
Wed Jul 24 20:11:36 2013
Variable Size
238 x 400
Open
Print All
Print Marked
Save All
Save Marked
Reload
400 GeV
y, cm
15
10
5
0
-5
-10
-15
20
15
10
5
0
-5
-10
x, cm
E, GeV
10^2
1
10^{-2}
10^{-4}
10^{-6}
the files will not be readable.
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Info in <TCanvas::Print>: Current canvas added to ps file out400GeV03.ps
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Task

- Create Histogram
- Find standard deviation
- Find energy resolution