

Cosmetics for ROOT

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05.08.2010

DESY



- **First steps:**

- go to `/afs/desy.de/user/k/kraemerm/summerstudents/`
- copy the complete directory to your favourite location using

```
> cp -r /afs/desy.de/user/k/kraemerm/summerstudents/ yourlocation
```

- set the ROOT environment using

```
> source rootenv.sh
```

- **Content:**

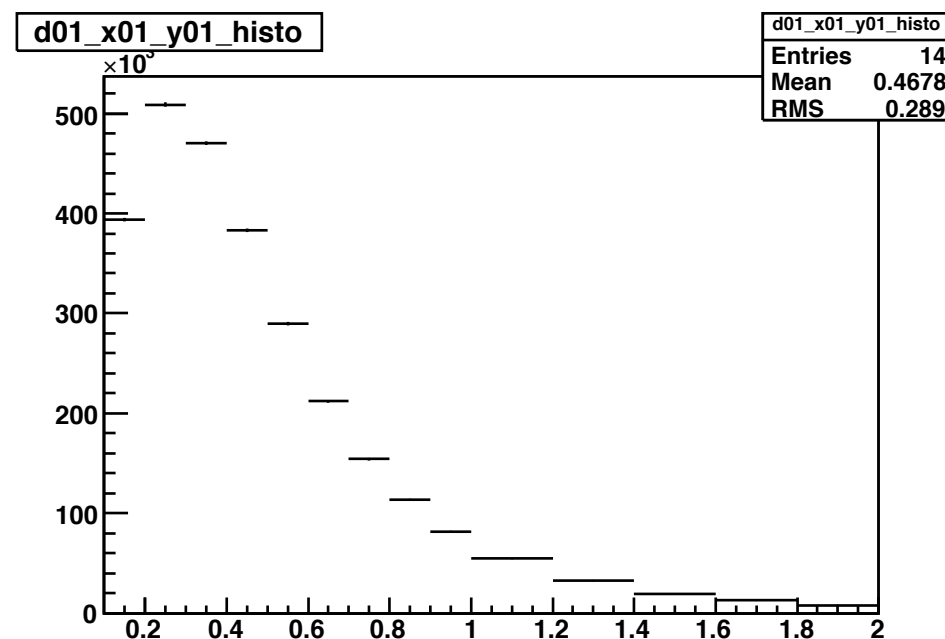
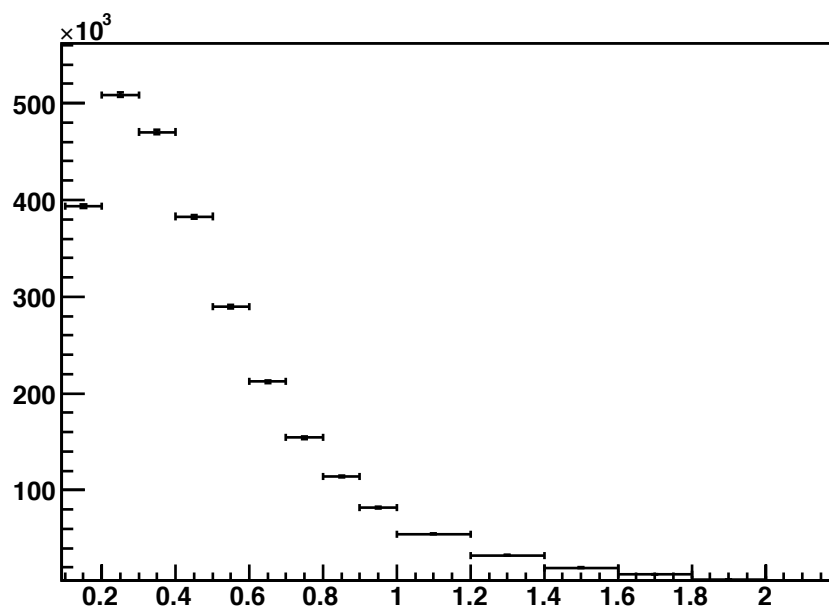
- you will find there a rootfile in `rootfiles/UEP0900_250000ev.root`
- several numbered ROOT macros which are called `MyMacro1.C`
- helper functions in `func.C`

- Start ROOT and use the first macro:

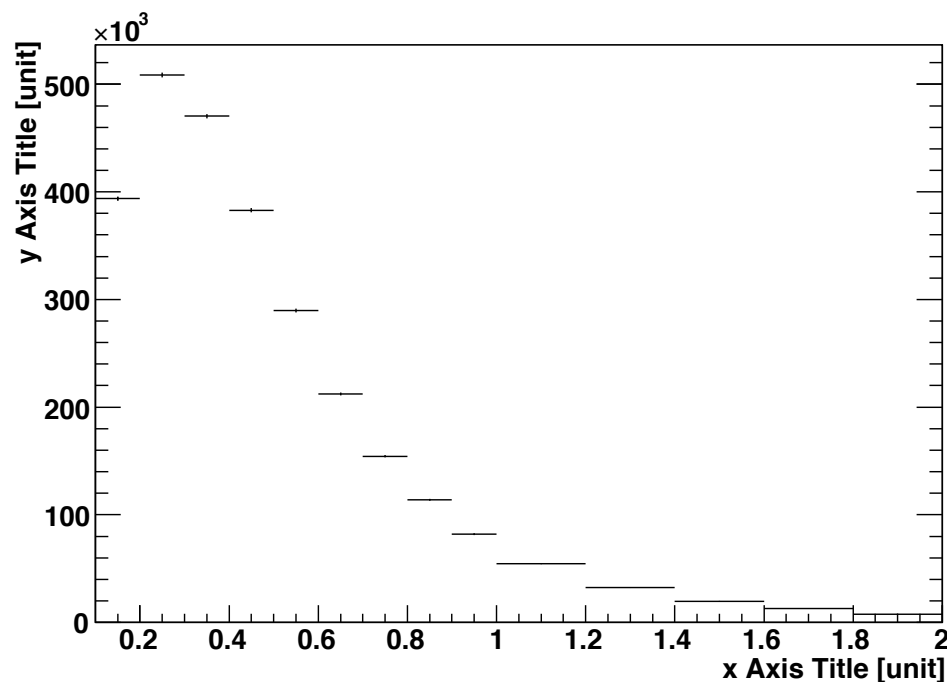
```
> root
```

```
> .x MyMacro1.C
```

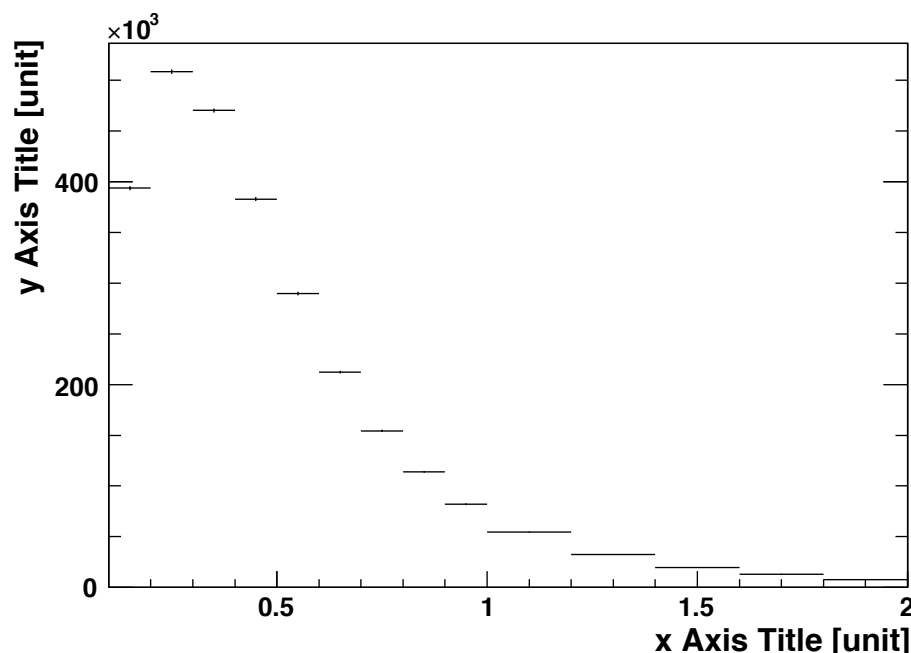
- You will find a TGraph on the left side and the corresponding TH1F on the right:



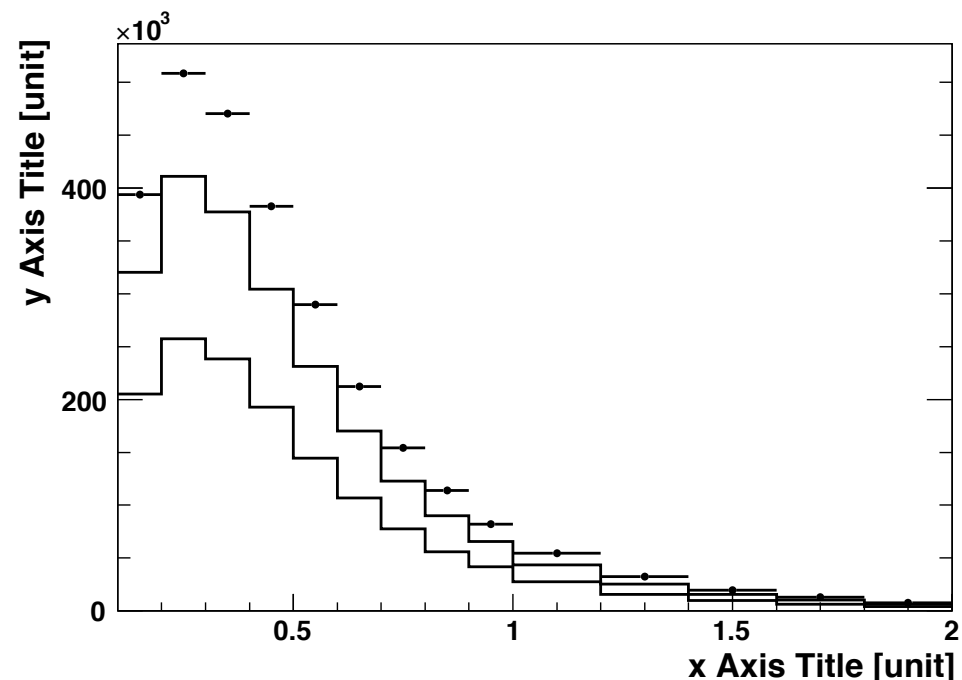
- Surroundings:
 - `gStyle->SetPadTickY(1);` // ticks on right side of histo
 - `gStyle->SetOptStat(0);` // get rid of the statistics box
 - `histo->SetTitle(„boxtitle;x axis title [unit];y axis title [unit]“)`
 - or: `histo->SetTitle(„;x axis title [unit];y axis title [unit]“)` // box is gone then



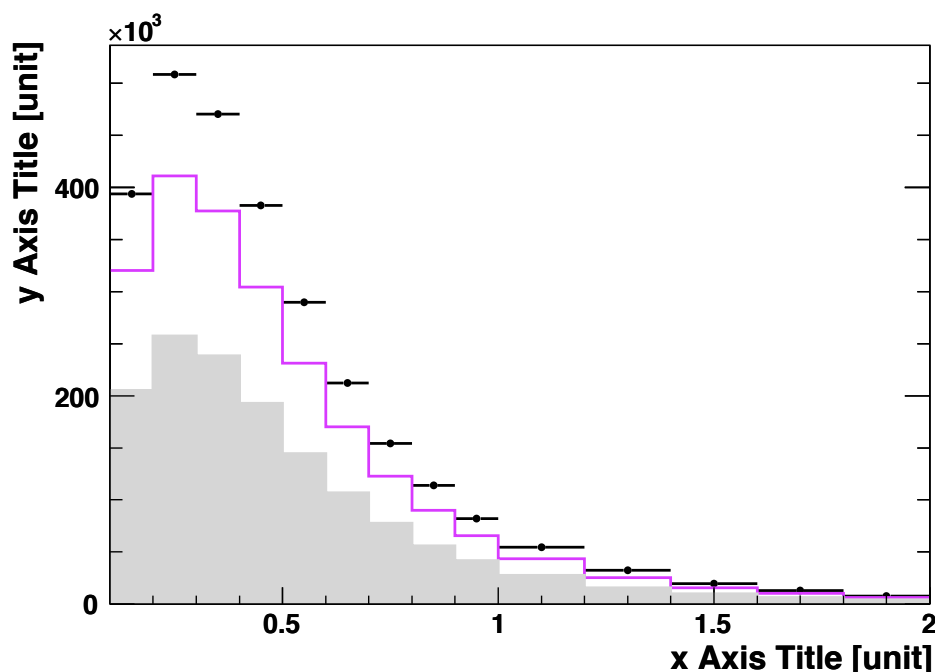
- Manipulate the labels: (following methods work for labels and titles)
 - `histo->SetLabelSize(0.04, "X,")` // the size
 - `histo->GetXaxis()->SetLabelOffset(number)` // shift
 - `histo->GetXaxis()->SetNdivisions(505)` // divisions of labels
 - `histo->GetXaxis()->SetRange(firstbin, lastbin)` // bin counting starts at 1



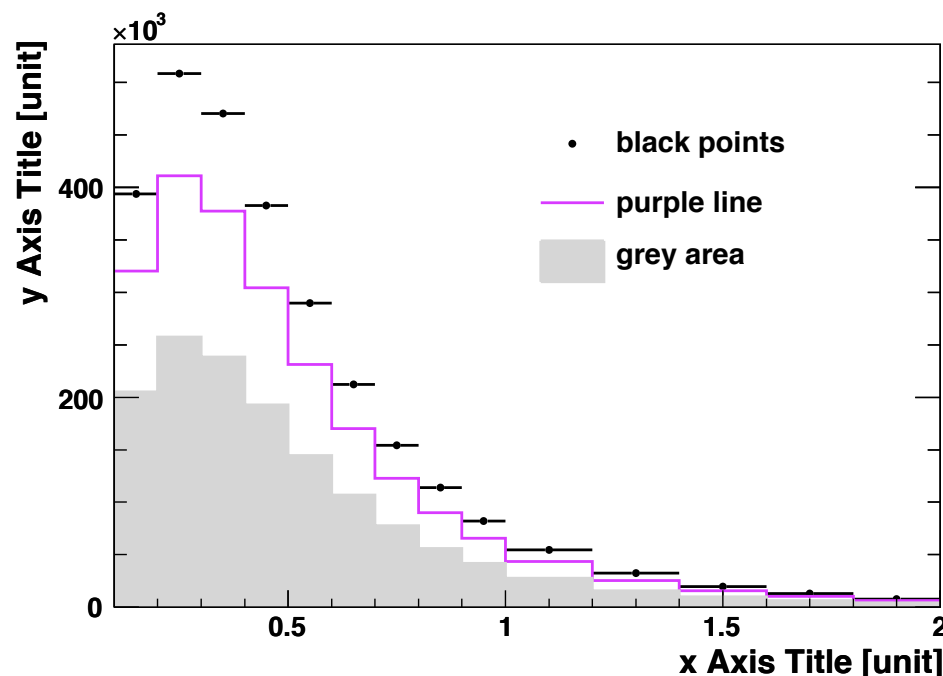
- Change the Style of the histogram:
 - `histo->SetLineWidth(2) // for better visibility`
 - `histo->SetMarkerStyle(8) // the dot. More markers on page 115 in the manual`
 - `histo->SetMarkerSize(0.7) // the size of the marker`
- Draw more histos as line to same canvas:
 - `histo1->Draw(„E“)`
 - `histo2->Draw(„samehist“)`
 - `histo3->Draw(„samehist“)`



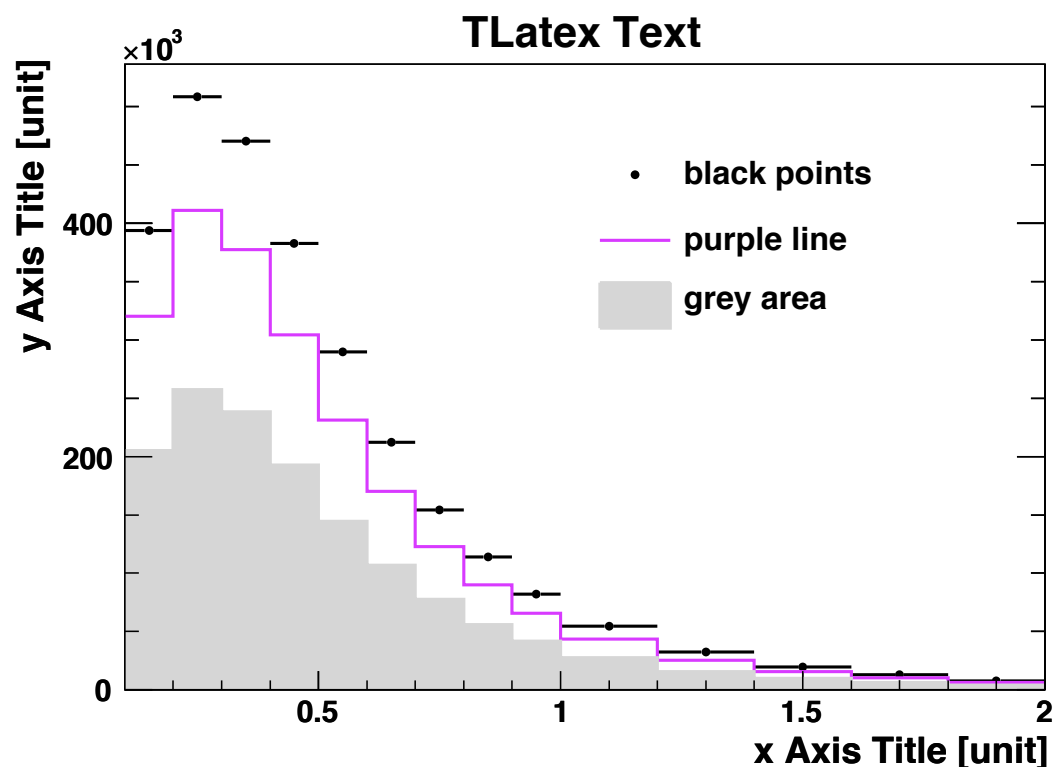
- `histo->SetLineColor(kViolet)` // see page 134 for color definitions
- `histo->SetFillColor(17)` // fills area below curve, but axes are gone then
- `histo->Draw(„sameaxis“)` // redraws the axes
- Btw: you can also define your own color:
- `YourColourName = new TColor(NewColourNumber,r,g,b,“NewColourName“)`



- `mylegend = new TLegend(x1,y1,x2,y2) // create legend`
- `mylegend->SetFillColor(0) // white background`
- `mylegend->SetBorderSize(0) // get rid of the box`
- `mylegend->SetTextSize(0.045) // set text size`
- `mylegend->AddEntry(&histo, "name,, , "option") // options: p,l,f`
- `mylegend->Draw();`

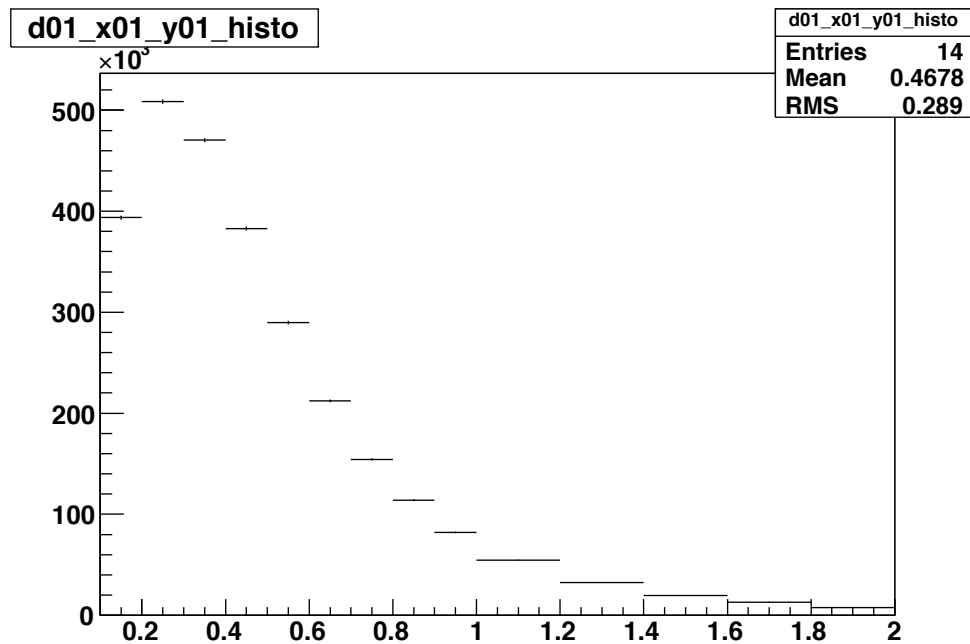


- To write additional text in histos, use TLatex with syntax \ -> #
- mylatex = new TLatex(x1,y1,"your text,") // coordinates are absolute here
- mylatex->SetTextSize(0.06);
- mylatex->Draw();

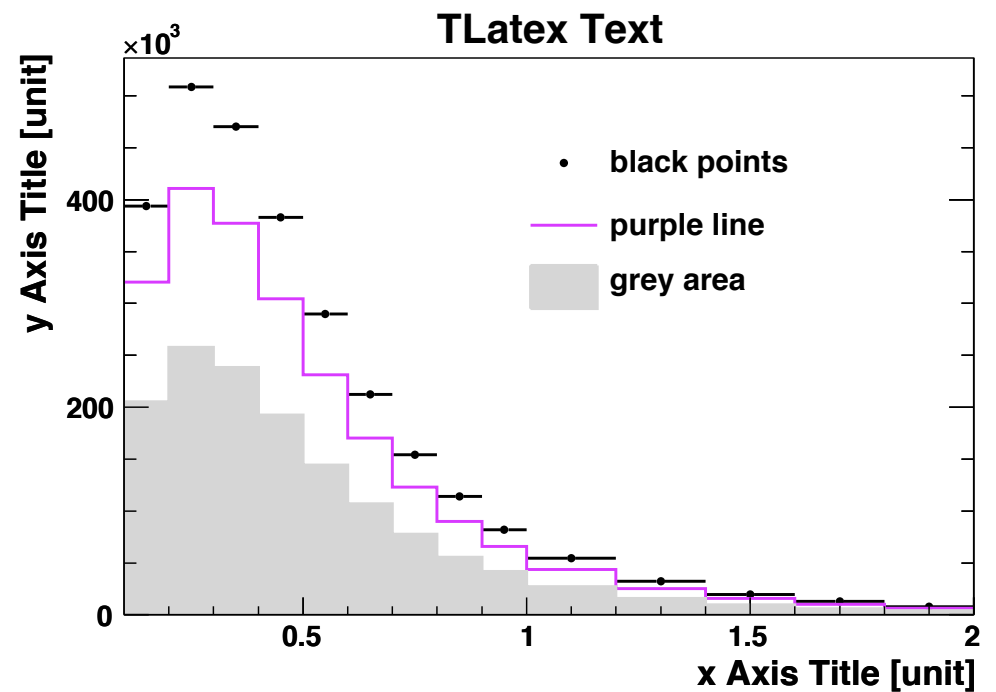


- To store the created histo as eps file (or whatever format you like):
- `mysubpad = (TPad*) mycanvas->GetPad(1) // create a TPad`
- `mysubpad->Print(„psfiles/MyHisto.eps“) // write it to the file`
- Check the eps file you just created
- the histo is in the middle, but the titles are close to the bottom and left margin
- redefine the margins with MyMacro9.C:
- `gPad->SetLeftMargin(0.14)`
- `gPad->SetRightMargin(0.08)`
- `gPad->SetBottomMargin(0.15)`
- `gPad->SetTopMargin(0.10)`

Default:



User defined:



- i. Change the style of the purple solid line to a dashed line in your favourite colour
 - ii. Change the style of the grey area from plain to one with a pattern
 - iii. Create artificial error bands for the histogram with black points: the upper error should be 10%, the lower one 15% for every point
- Hint: Have a look at the ROOT manual
<http://root.cern.ch/drupal/content/users-guide>
 - See also the class descriptions at
<http://root.cern.ch/root/html526/ClassIndex.html>