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Subject: getting run\_rutherford to calculate eta parameter [SOLVED]

Posted by [Raphael Cervantes](#) on Wed, 14 Nov 2012 20:18:02 GMT

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Hi all,

I would like to request help in modifying fairroot to give me information about  $\eta = -\log(\tan(\theta/2))$ , which is a very common parameter for understanding detector physics. Moreover, I think it should calculate eta by default, in the same way that it calculates phi and theta by default.

To give more background:

The way fairbase is in the repository, if you do

```
root fairroot/examples/rutherford/macros/run_rutherford.C
```

the output is contained in fairroot/examples/rutherford/macros/data/test.mc.root.

If I open the root file

```
root data/test.mc.root
```

```
TBrowser j
```

Then you will see the attached image. I would like to modify fairroot to include information about eta as one of the leaves of FairRutherfordPoint. Can someone tell me how to do that? Would I need to make changes to FairRutherfordPoint? FairMCPoint? etc...

I hope I'm making myself clear. All help is greatly appreciated

-Raphael

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## File Attachments

1) [test.mc.root.png](#), downloaded 753 times

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# Object Browser

Browser File Edit View Options Tools

Files



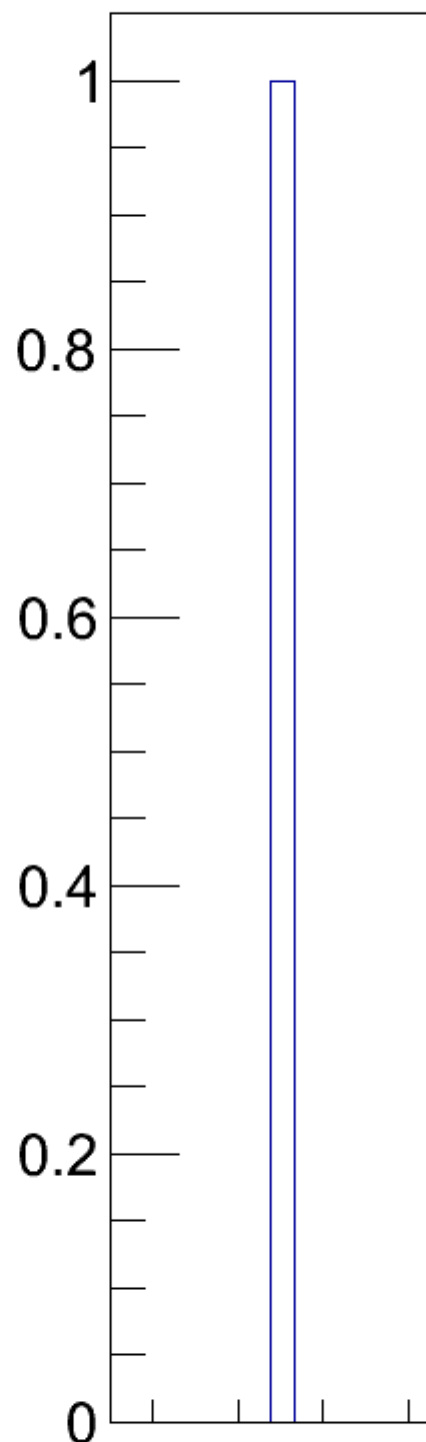
Draw Option:

- root
- PROOF Sessions
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  - data/test.mc.root
    - cbmroot;1
    - BranchList;1
    - FileHeader;1
    - cbmsim;1
      - MCTrack
      - FairRutherfordPoint
        - FairRutherfordPoint.fUniqueID
        - FairRutherfordPoint.fBits
        - FairRutherfordPoint.fLinks
        - FairRutherfordPoint.fPersistenceCheck
        - FairRutherfordPoint.fVerbose
        - FairRutherfordPoint.fDefaultType
        - FairRutherfordPoint.fTrackID
        - FairRutherfordPoint.fEventId
        - FairRutherfordPoint.fPx
        - FairRutherfordPoint.fPy
        - FairRutherfordPoint.fPz
        - FairRutherfordPoint.fTime
        - FairRutherfordPoint.fLength
        - FairRutherfordPoint.fELoss
        - FairRutherfordPoint.fDetectorID
        - FairRutherfordPoint.fX
        - FairRutherfordPoint.fY
        - FairRutherfordPoint.fZ
        - FairRutherfordPoint.fRadius
        - FairRutherfordPoint.fPhi
        - FairRutherfordPoint.fTheta
      - @size
      - MCEventHeader.
      - GeoTracks

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      - cpractice
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      - eicroot
      - fairbase
      - fairroot
      - fastjet-3.0.3
      - h1dummy

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Canvas\_1 ☐ Editor 1 ☐



Command

Command (local):

Subject: Re: getting run\_rutherford to calculate eta parameter  
Posted by [Radoslaw Karabowicz](#) on Wed, 14 Nov 2012 21:59:56 GMT  
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Dear Raphael,

If you need some extra variable to be written to the root file,  
then:

1. you have to edit FairRutherfordPoint.h and add the variable  
in question to the private members, f.e.:

Float\_t fEta;

2. edit the FairRutherfordPoint.cxx and set the value  
of the variable in the constructors, preferably after the places  
when the fTheta values are set:

fEta = -TMath::Log(TMath::Tan(fTheta/2.));

3. recompile

4. run the macro

Hopefully you will get the variable in the output tree as fEta.

yours  
radek

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Subject: Re: getting run\_rutherford to calculate eta parameter [SOLVED]  
Posted by [Raphael Cervantes](#) on Thu, 15 Nov 2012 15:53:34 GMT  
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Thank you Radek,  
That did the trick. For those who may have the same question as I do and who are as clueless  
as I am, make sure you include the TMath header in FairRutherfordPoint.cxx at the top so that  
compiling knows what is going on with Tan and Log  
#include "TMath.h"  
Do this at step 2.

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