

Status Mass Production w/ ILCDIRAC

C. Calancha
ILD Analysis & Software Meeting

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ilcdirac productions validation

Status

- We can now run productions locally.
 - We can set Mokka random seeds.
- We can download the tarball with the apps. executables.

- Looking for differences comming when: using/not using ilcdirac.
 - Running over same input files, under same conditions (random seed, software versions, OS).
 - Each time, the only difference is using/not using the ilcdirac to run the job.
 - Assumes Mokka reproductivity is guarantee: same input provides always same output (**Is this true ?**).

Is Mokka reproductivity guarantee?

- There are two minimum input differences: in the Mokka steer file:
 - 1 The steer file should be different: at least the file names, to avoid overwrite.
 - 2 ilcdirac introduced several comment lines: each time set one parameter in the steer file.
- Any of these two differences should affect the result.

Comment lines on Mokka steer may change output

- I have check out separately these two point.
- Output lcio file name has no effect.
- But comment lines may have (!).

Just Adding a Different Comment String

diff mokka_6.steer mokka_7.steer

```
56c56
< # hello world
---
> # To be a comment or not to be a comment
64c64
< /Mokka/init/lcioFilename out/out_6.slcio
---
> /Mokka/init/lcioFilename out/out_7.slcio
```

Same software version (v01-14-01) used to sim/rec

- First 2 events no difference.
- Since the 3rd event, we see differences in the event collections.
- Previous Diff. in the steer file are the only differences
 - Same event, but different # of particles (affect E/P net balance).
 - Input stdhep, soft versions are the same.

Comment String Same Length

diff mokka_20_bis.steer mokka_19_bis.steer

```
56c56
< # my mother says i'm a comment, but i'm not
---
> # my name is de la isla, camaron de la isla
64c64
< /Mokka/init/lcioFilename out/out_20_bis.slcio
---
> /Mokka/init/lcioFilename out/out_19_bis.slcio
```

- I got same output.
 - Tested on ilcsoft v01-14-01 and v01-17-06.
- In this case both steer has same size.
 - I've been suggested to run using modified `Mokka` version not storing steer files in lcio header.
 - I have checkout that for `Mokka tag mokka-08-03` and i get similar behaviour.

Using Latest ilcsoft (v01-17-06)

diff mokka_18_latest.steer mokka_19_latest.steer

```
56c56
< # my name is bond, james bond
---
> # my name is de la isla, camaron de la isla
64c64
< /Mokka/init/lcioFilename out/out_18_latest.slcio
---
> /Mokka/init/lcioFilename out/out_19_latest.slcio
```

- With this version i got same output.
- But the problem is still there (next slide).

ilcsoft (v01-17-06) Higher Verbosity Steer

```
diff mokka-ilcdirac_21.steer mokka-ilcdirac_22.steer
```

```
56d55
< #Set detector model to value specified
58d56
< #Set debug level to 2
60d57
< #Set batch mode to true
62d58
< #Set mac file to the one created on the site
64d59
< #Setting random seed
66d60
< #Setting run number, same as seed
68,70c62,63
< #Set outputfile name to job specified
< /Mokka/init/lcioFilename out/out_21.slcio
< #Set processID as event parameter
---
> /Mokka/init/lcioFilename out/out_22.slcio
>
76c69
< #Set event start number to value given as job parameter
---
>
```

- Those comments are added by ilcdirac each time set an input parameter in the steering file.
- First 2 events looks same, but **clear differences in advance!**.

Last Comments

- The fact that comment lines on the steering file may affect simulation program sounds more like a bug than a desirable feature.
 - For ilcdirac validation may have an impact because ilcdirac add several comment lines in the `Mokka` steer file.
-
- ilcdirac copies apps. executables from AFS (as far as i know).
 - Marlin exec. carried by ilcdirac exactly binary copy as AFS file.
 - For Mokka exec. file sizes dont match.

Where got ilcdirac the Mokka executable?

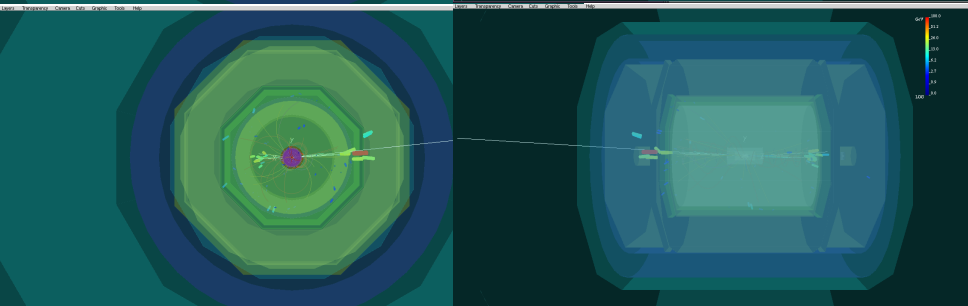
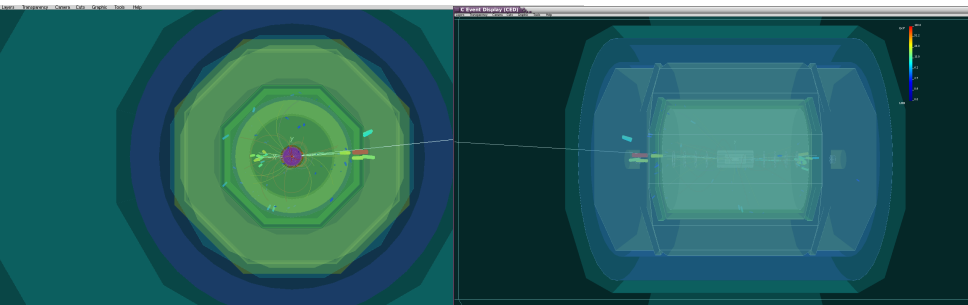
```
*) From AFS:
AFS_DIR=/afs/desy.de/project/ilcsoft/sw/x86_64_gcc41_sl5/v01-16-02/Marlin/v01-04/bin/
env find $AFS_DIR -name "Marlin" -printf "%s %p\n"
763903 /afs/desy.de/project/ilcsoft/sw/x86_64_gcc41_sl5/v01-16-02/Marlin/v01-04/bin/Marlin
*) From ilcdirac tarball:
ILC_DIR=/gpfs/fs01/ilc/users/calancha/ILCDIRAC/LocalArea/Marlinv01-16-02/Executable/
env find $ILC_DIR -name "Marlin" -printf "%s %p\n"
763903 /gpfs/fs01/ilc/users/calancha/ILCDIRAC/LocalArea/Marlinv01-16-02/Executable/Marlin
(same file)

**) ILC_DIR=/gpfs/fs01/ilc/users/calancha/ILCDIRAC/LocalArea/Mokka080003/Mokka
env find $ILC_DIR -name "Mokka" -printf "%s %p\n"
594839 /gpfs/fs01/ilc/users/calancha/ILCDIRAC/LocalArea/Mokka080003/Mokka
no same file found under:
/afs/desy.de/project/ilcsoft/sw/x86_64_gcc41_sl5/
```


Back Up Slides

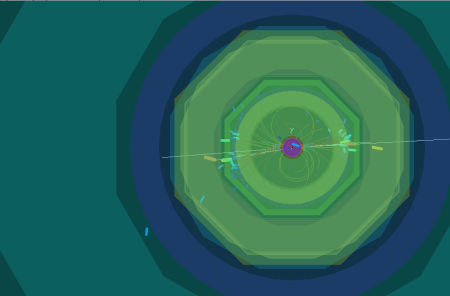
- Event display for a few events in one of the performed tests
 - Differences coming from inserting one comment line in the steer file.
- I did not check all the events.
 - Differences may be larger that showed here in other cases.

Event 1 (Same)

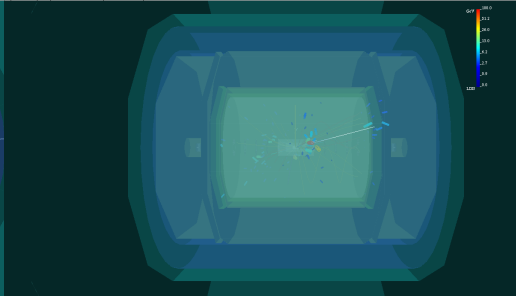


Event 2 (Some Differences)

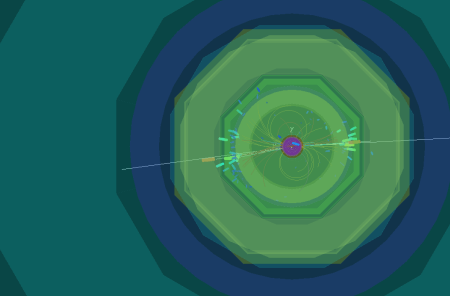
Event 2: Topology, Colors, Cuts, Grains, Tools, Help



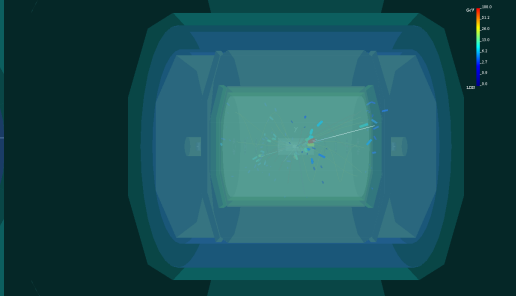
Event 2: Topology, Colors, Cuts, Grains, Tools, Help



Event 2: Topology, Colors, Cuts, Grains, Tools, Help



Event 2: Topology, Colors, Cuts, Grains, Tools, Help



Event 2 (Some Differences)

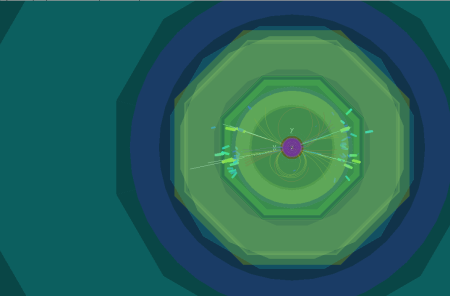
```
Applications Places System 2°C Fri Jan 30, 13:01 Const...
xterm
[ DEBUG3 "MyDSTViewer" ] Particle : 94 Type : 3122 PX = -5.318065 PY = -0.307110 PZ = 1.427611 P_tot = 5.514908 Charge = 0.000000 E = 5.928513
[ DEBUG "MyDSTViewer" ] Unassigned type of colour: default
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 95 Type : 211 PX = 1.613314 PY = 0.340524 PZ = -0.791130 P_tot = 1.828832 Charge = 1.000000 E = 1.834150
[ DEBUG3 "MyDSTViewer" ] Particle : 96 Type : 22 PX = 0.475111 PY = 0.147307 PZ = -0.251124 P_tot = 0.557220 Charge = 0.000000 E = 0.557220
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 97 Type : -211 PX = 4.388795 PY = 0.038353 PZ = -2.870278 P_tot = 5.241676 Charge = -1.000000 E = 5.243534
[ DEBUG3 "MyDSTViewer" ] Particle : 98 Type : -211 PX = -1.632452 PY = 0.191914 PZ = 0.611496 P_tot = 1.753756 Charge = -1.000000 E = 1.759300
[ DEBUG3 "MyDSTViewer" ] Particle : 99 Type : -211 PX = -3.711717 PY = 0.462786 PZ = 0.748632 P_tot = 3.814638 Charge = -1.000000 E = 3.817191
[ DEBUG3 "MyDSTViewer" ] Particle : 100 Type : -211 PX = 1.472372 PY = -0.252858 PZ = -0.814362 P_tot = 1.701471 Charge = -1.000000 E = 1.707185
[ DEBUG3 "MyDSTViewer" ] Particle : 101 Type : 22 PX = 3.849463 PY = -0.421575 PZ = -2.724746 P_tot = 4.735011 Charge = 0.000000 E = 4.735011
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 102 Type : 211 PX = 27.554861 PY = -4.617208 PZ = -0.048157 P_tot = 27.939064 Charge = 1.000000 E = 27.939413
[ DEBUG3 "MyDSTViewer" ] Particle : 103 Type : 22 PX = 0.393810 PY = 0.369808 PZ = 0.041350 P_tot = 0.541807 Charge = 0.000000 E = 0.541807
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ MESSAGE "MyDSTViewer" ]
[ MESSAGE "MyDSTViewer" ] Total Energy and Momentum Balance of Event.
[ MESSAGE "MyDSTViewer" ] Energy = 484.938354 PX = -19.863691 PY = 6.012734 PZ = -8.636895 Charge = 1.000000
[ MESSAGE "MyDSTViewer" ]
[ DEBUG2 "MyDSTViewer" ] Setup properties
[ DEBUG2 "MyDSTViewer" ] B.Field = 3.500000 T
[ MESSAGE "MyDSTViewer" ] Double click for picking. Press <ENTER> for the next event.

--F1 t6 Bot L36646 (Shell:run)
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 93 Type : 2112 PX = -3.989326 PY = 0.262861 PZ = 4.429277 P_tot = 5.967102 Charge = 0.000000 E = 5.967102
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 94 Type : 22 PX = -0.199190 PY = 0.008768 PZ = 0.052214 P_tot = 0.206106 Charge = 0.000000 E = 0.206106
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 95 Type : -211 PX = 0.318540 PY = 0.023642 PZ = -2.190152 P_tot = 2.213322 Charge = -1.000000 E = 2.217718
[ DEBUG3 "MyDSTViewer" ] Particle : 96 Type : -211 PX = -8.215693 PY = 0.748916 PZ = 1.416659 P_tot = 8.370509 Charge = -1.000000 E = 8.371673
[ DEBUG3 "MyDSTViewer" ] Particle : 97 Type : 211 PX = 1.090400 PY = -0.016476 PZ = -0.173584 P_tot = 1.104253 Charge = 1.000000 E = 1.113038
[ DEBUG3 "MyDSTViewer" ] Particle : 98 Type : 22 PX = -6.808722 PY = 0.279713 PZ = 1.584417 P_tot = 6.996236 Charge = 0.000000 E = 6.996236
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 99 Type : 3122 PX = -5.314058 PY = -0.308168 PZ = 1.426535 P_tot = 5.510824 Charge = 0.000000 E = 5.924130
[ DEBUG "MyDSTViewer" ] Unassigned type of colour: default
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 100 Type : 22 PX = 1.289033 PY = 0.198287 PZ = -0.913313 P_tot = 1.592188 Charge = 0.000000 E = 1.592188
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ MESSAGE "MyDSTViewer" ]
[ MESSAGE "MyDSTViewer" ] Total Energy and Momentum Balance of Event.
[ MESSAGE "MyDSTViewer" ] Energy = 513.243225 PX = 6.192719 PY = -0.111462 PZ = -10.381721 Charge = -2.000000
[ MESSAGE "MyDSTViewer" ]
[ DEBUG2 "MyDSTViewer" ] Setup properties
[ DEBUG2 "MyDSTViewer" ] B.Field = 3.500000 T
[ MESSAGE "MyDSTViewer" ] Double click for picking. Press <ENTER> for the next event.

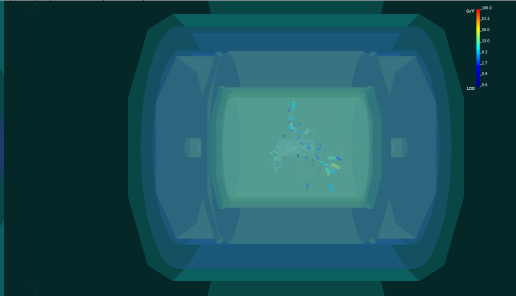
--F1 t7 Bot L36723 (Shell:run)
```


Event 3 (Some Differences)

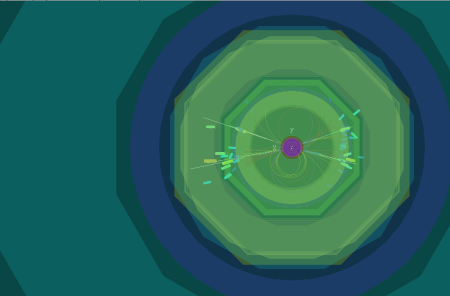
Level 1: Topology, Count, Color, Graticule, Time, Map



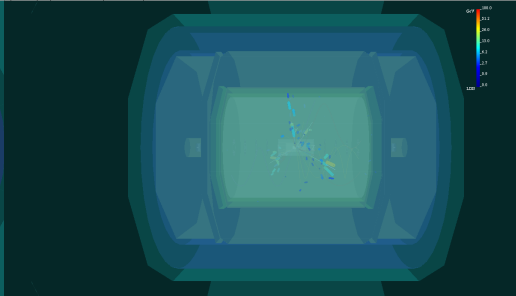
Level 1: Topology, Count, Color, Graticule, Time, Map



Level 1: Topology, Count, Color, Graticule, Time, Map

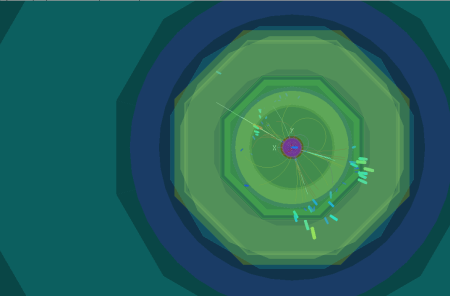


Level 1: Topology, Count, Color, Graticule, Time, Map

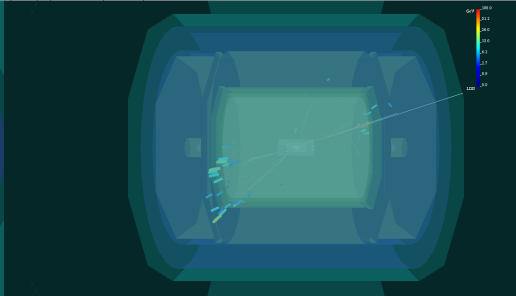


Event 4 (Some Differences)

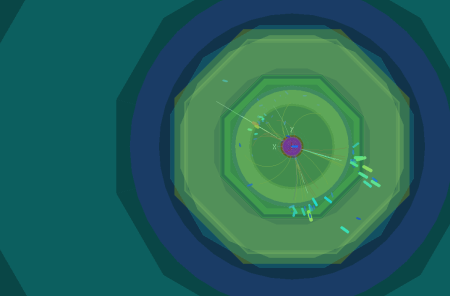
Level 1 Tracker Count Data Graticule Tools Help



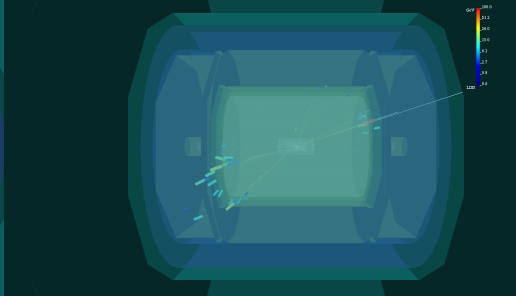
Level 1 Tracker Count Data Graticule Tools Help



Level 1 Tracker Count Data Graticule Tools Help



Level 1 Tracker Count Data Graticule Tools Help



Event 4 (Some Differences)

```
Applications Places System 2 °C Fri Jan 30, 13:01 Const...
xterm
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 56 Type : 22 PX = -0.660311 PY = -1.828372 PZ = -1.976964 P_tot = 2.772606 Charge = 0.000000 E = 2.772606
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 57 Type : 2112 PX = -0.173058 PY = -0.033530 PZ = -0.250609 P_tot = 0.306395 Charge = 0.000000 E = 0.306395
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 58 Type : 22 PX = 0.034061 PY = 0.25718 PX = 0.113766 P_tot = 0.283763 Charge = 0.000000 E = 0.283763
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 59 Type : 211 PX = -0.659568 PY = -4.051832 PZ = -6.196676 P_tot = 7.433113 Charge = 1.000000 E = 7.434423
[ DEBUG3 "MyDSTViewer" ] Particle : 60 Type : -211 PX = 0.908488 PY = 0.872555 PZ = 0.427363 P_tot = 1.330166 Charge = -1.000000 E = 1.337468
[ DEBUG3 "MyDSTViewer" ] Particle : 61 Type : 211 PX = -1.688277 PY = -4.194442 PZ = -6.592832 P_tot = 7.994314 Charge = 1.000000 E = 7.995533
[ DEBUG3 "MyDSTViewer" ] Particle : 62 Type : -211 PX = 0.113933 PY = -0.793939 PZ = -0.932738 P_tot = 1.230171 Charge = -1.000000 E = 1.238063
[ DEBUG3 "MyDSTViewer" ] Particle : 63 Type : 22 PX = -0.043185 PY = -0.307117 PZ = -0.313128 P_tot = 0.440721 Charge = 0.000000 E = 0.440721
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 64 Type : 2112 PX = 0.065277 PY = 0.003811 PZ = 1.018961 P_tot = 1.021056 Charge = 0.000000 E = 1.021057
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ MESSAGE "MyDSTViewer" ]
[ MESSAGE "MyDSTViewer" ] Total Energy and Momentum Balance of Event.
[ MESSAGE "MyDSTViewer" ] Energy = 469.750763 PX = -1.963846 PY = -10.831343 PZ = 12.248179 Charge = 0.000000
[ MESSAGE "MyDSTViewer" ]
[ DEBUG2 "MyDSTViewer" ] Setup properties
[ DEBUG2 "MyDSTViewer" ] B_Field = 3.500000 T
[ MESSAGE "MyDSTViewer" ] Double click for picking. Press <ENTER> for the next event.

--F1 t6 Bot L36911 (Shell:run)
[ DEBUG3 "MyDSTViewer" ] Particle : 61 Type : 211 PX = -10.080924 PY = -2.901120 PZ = 11.373954 P_tot = 15.472826 Charge = 1.000000 E = 15.473455
[ DEBUG3 "MyDSTViewer" ] Particle : 62 Type : 22 PX = 0.301414 PY = 1.291520 PZ = 0.271147 P_tot = 1.353660 Charge = 0.000000 E = 1.353660
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 63 Type : 22 PX = -8.490582 PY = -2.417883 PZ = -9.663867 P_tot = 13.089174 Charge = 0.000000 E = 13.089175
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 64 Type : 211 PX = -0.380224 PY = 0.676925 PZ = 1.097979 P_tot = 1.344751 Charge = 1.000000 E = 1.351975
[ DEBUG3 "MyDSTViewer" ] Particle : 65 Type : 211 PX = -0.031340 PY = 0.183572 PZ = -0.182669 P_tot = 0.260861 Charge = 1.000000 E = 0.295852
[ DEBUG3 "MyDSTViewer" ] Particle : 66 Type : 22 PX = -3.140560 PY = -0.792623 PZ = -3.011551 P_tot = 4.422760 Charge = 0.000000 E = 4.422760
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 67 Type : 2112 PX = 1.015012 PY = 1.399377 PZ = 0.576219 P_tot = 1.822233 Charge = 0.000000 E = 1.822233
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 68 Type : 211 PX = -1.216624 PY = -5.026414 PZ = -5.737207 P_tot = 7.724025 Charge = 1.000000 E = 7.725286
[ DEBUG3 "MyDSTViewer" ] Particle : 69 Type : 22 PX = -1.193770 PY = -0.260345 PZ = -1.314567 P_tot = 1.794701 Charge = 0.000000 E = 1.794701
[ DEBUG "MyDSTViewer" ] Low momentum particle given point instead of helix
[ DEBUG3 "MyDSTViewer" ] Particle : 70 Type : -211 PX = -12.298915 PY = -3.572956 PZ = -14.886720 P_tot = 19.637814 Charge = -1.000000 E = 19.638309
[ MESSAGE "MyDSTViewer" ]
[ MESSAGE "MyDSTViewer" ] Total Energy and Momentum Balance of Event.
[ MESSAGE "MyDSTViewer" ] Energy = 475.366089 PX = -15.440767 PY = -17.675264 PZ = -6.678852 Charge = -1.000000
[ MESSAGE "MyDSTViewer" ]
[ DEBUG2 "MyDSTViewer" ] Setup properties
[ DEBUG2 "MyDSTViewer" ] B_Field = 3.500000 T
[ MESSAGE "MyDSTViewer" ] Double click for picking. Press <ENTER> for the next event.

--F1 t7 Bot L37003 (Shell:run)
```