Event Display

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Fermilab

B-reconstruction and tagging Meeting

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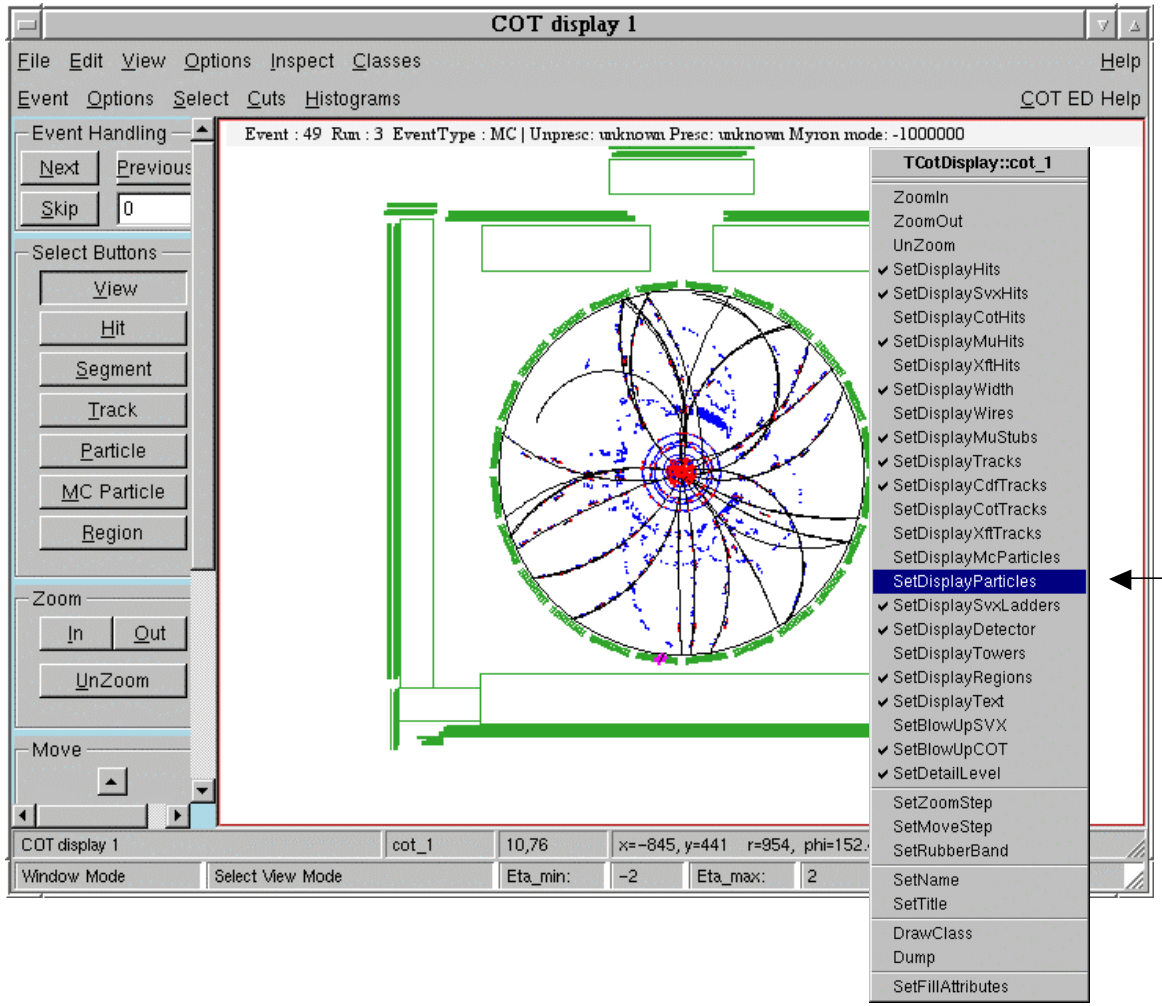
Contents

- Reconstructed particle display: example using file with reconstructed secondary vertices done by Ilya
- Remidener on how to select decay chain using MC data and MC particle display

COT Display Context Menu



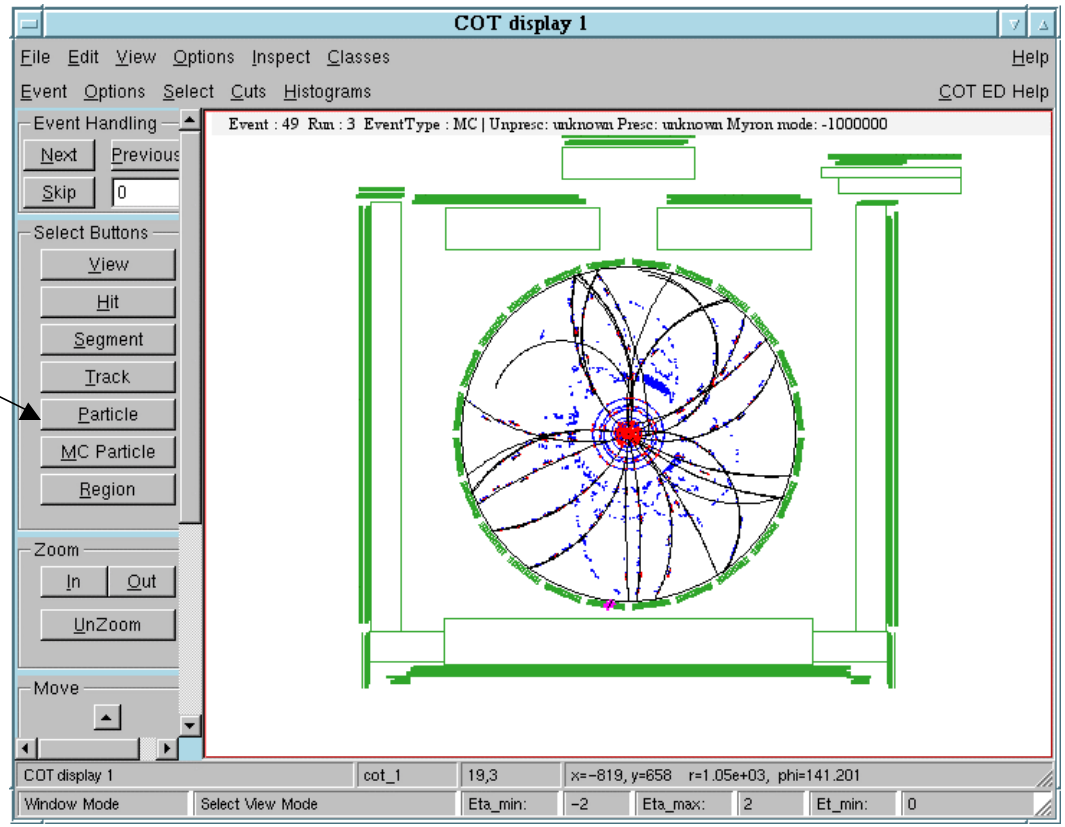
Right Mouse Button click when Window is in the *Select View Mode* brings up COT *Context Menu* which allows to toggle different display items

Displays Reconstructed Particles On/Off

New Button

Select Particle Button

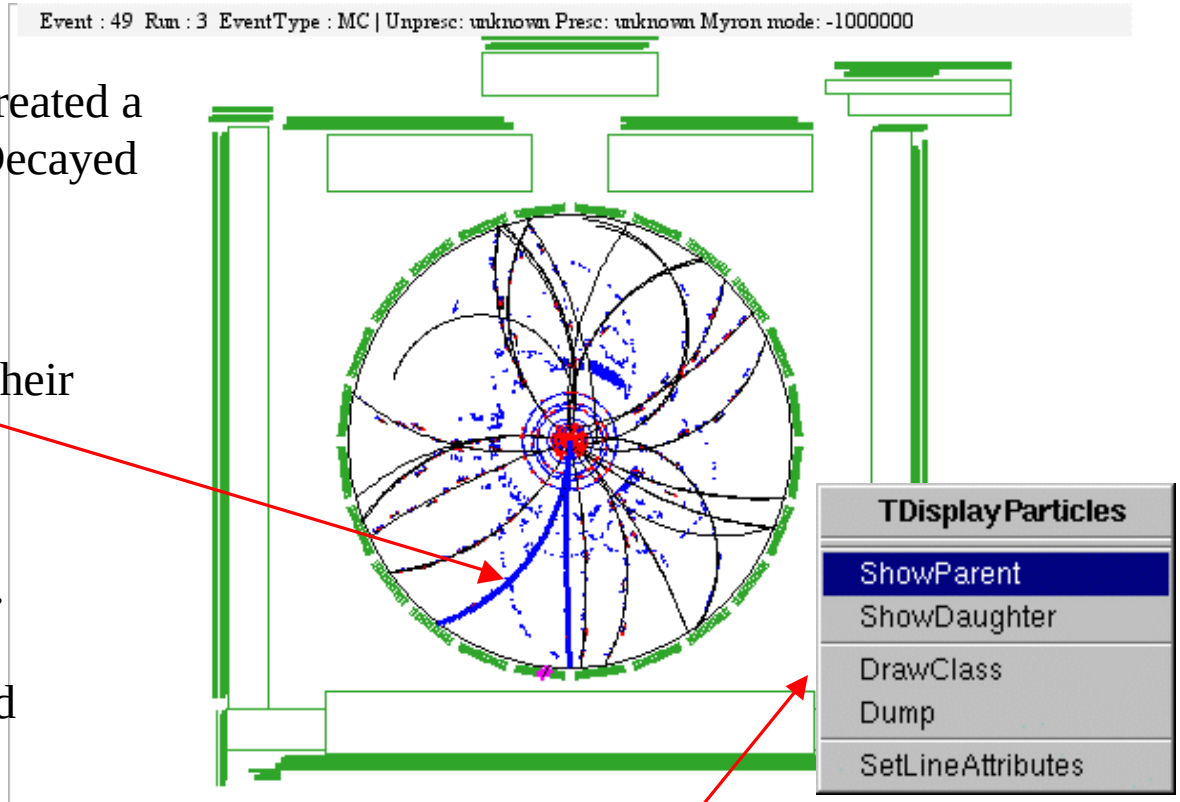
Puts Window into “select particle Mode” which allows to interact with reconstructed particles.



Particles Displayed

In this example we looked for V0 Collection and for each K0S there created a Set of Stable Particles (pions) and Decayed Particles (K0S)

Stable Particles have their tracks highlighted



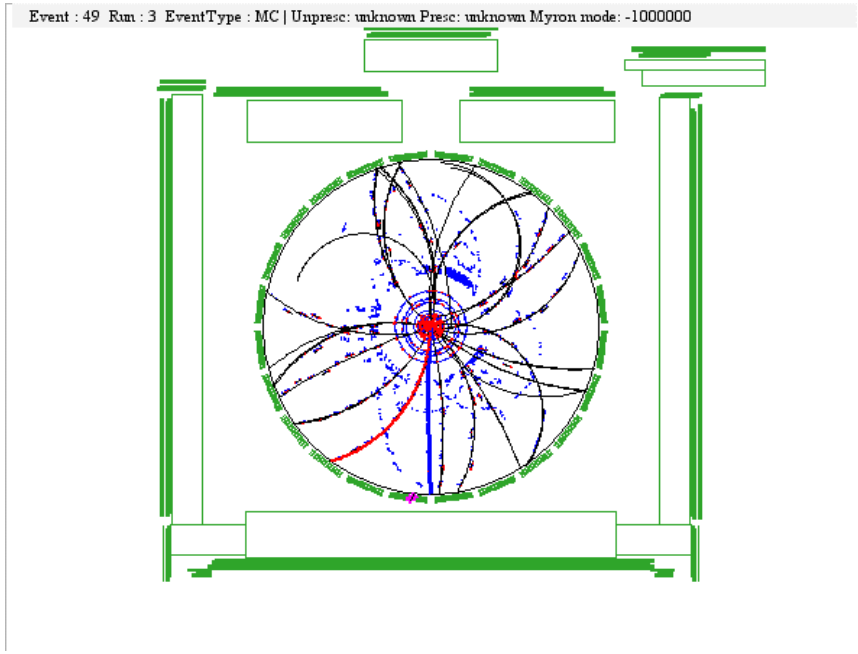
Move cursor to particle of interest. Left mouse button click would produce a dump of kinematical and tracking information about this particle.

Thus selected particle will become red.

Righ mouse click, when cursor is over the particle brings up *TDisplayParticle Context Menu*To Display Parent toggle *Show Parent*

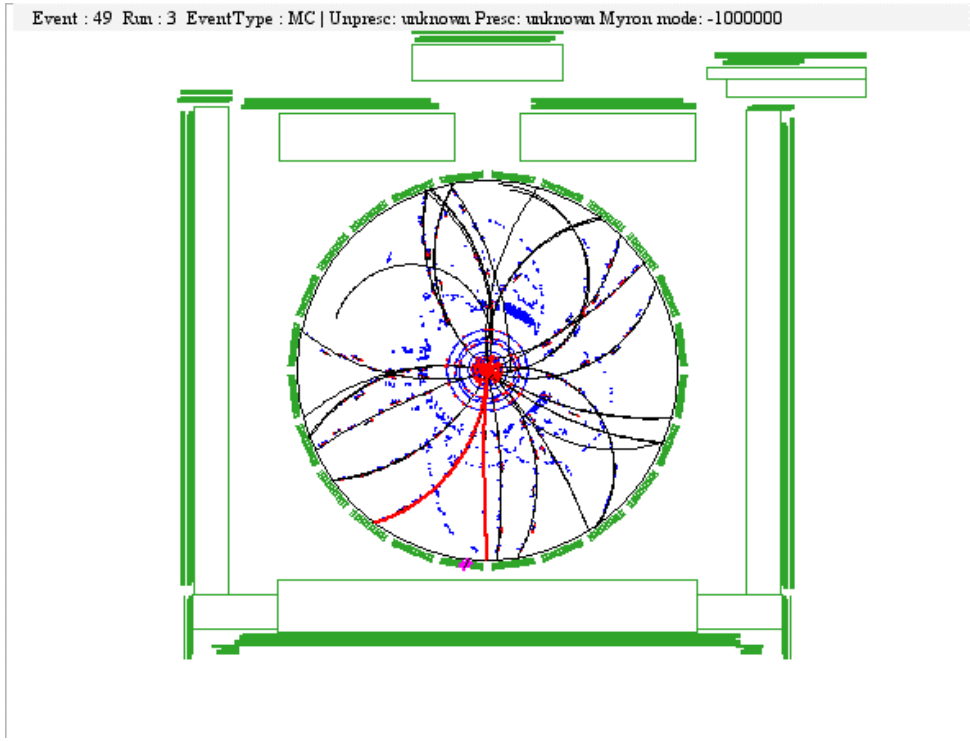
Selected Stable particle

```
Reconstructed Particle  pi-
Kinematics
Mass            : 0.1396
Px              : -0.2636
Py              : -4.3384
Pz              : -0.9370
Pt              : 4.3464
Rapidity        : -0.2138
Track id  58    OID 201
  Algorithm = 4
  Parent track:  11   No child track.
  Si hits:  9 total;  5 Phi;  4 S-A;  0 90 deg;  Mask =3dc03000;  Vtx = 0
        L  P B S T  N   Q    Local Res    L  P B S T  N   Q    Local Res
        6 20 1 0 P  2  28  -2.7145  43    6 20 1 0 S  1  29   2.7420  21
        6 19 1 0 P  1  29   2.4910  21    6 19 1 0 S  1  32  -2.4550  21
        5  9 1 0 P  1  30  -0.7030  12    5  9 1 0 S  2  29   0.6925  25
        4  9 1 0 P  2  34  -0.5375  23    3  9 1 0 P  3  64  -0.4090  23
        3  9 1 0 S  3  72   0.4630  23
  COT hits: 82 total;  36 axial;  46 stereo
        82 COT hit links present.
  Fit:  (not valid  )
      Pt  = 0.4958  Eta = -0.3513
      Rcot  = -0.3586 +/- 0.0051
      curv = -0.0043 +/- 0.0000
      z0   = -0.5756 +/- 0.0982
      d0   = -0.1604 +/- 0.0157
      p0   = 4.7015 +/- 0.0031
----------Cdf_Track   : 0x0xf8798f0
fit status          : 4
    2.6408e-05    3.3001e-08    -0.00030884    -3.9773e-06    1.8752e-07
    3.3001e-08    7.4458e-11    -2.2796e-07    2.9061e-09    -9.5112e-10
   -0.00030884    -2.2796e-07    0.0096395    0.00026951    -2.9185e-05
   -3.9773e-06    2.9061e-09    0.00026951    0.00024699    -4.4308e-05
    1.8752e-07    -9.5112e-10    -2.9185e-05    -4.4308e-05    9.6531e-06
```

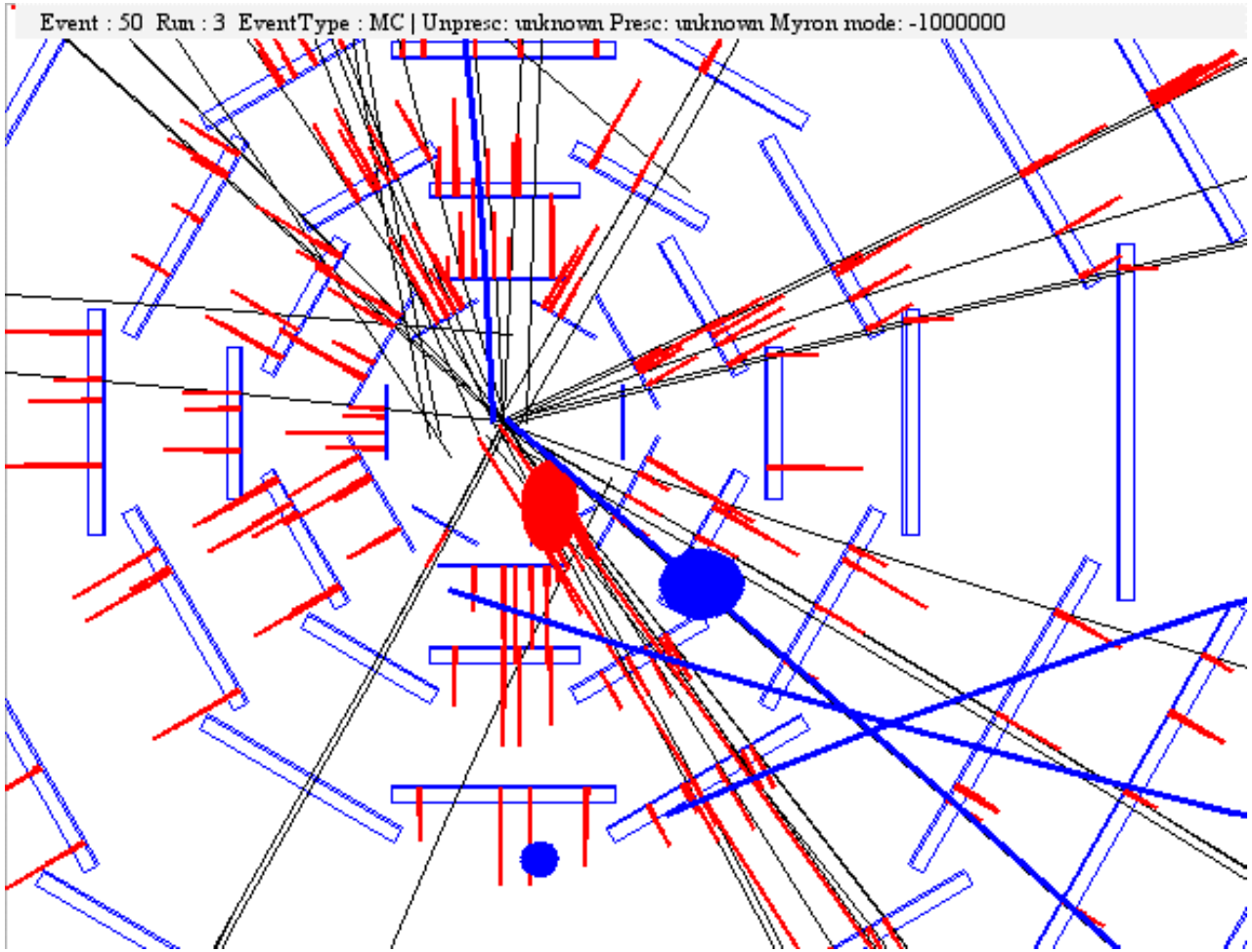


Selected Decayed Particle

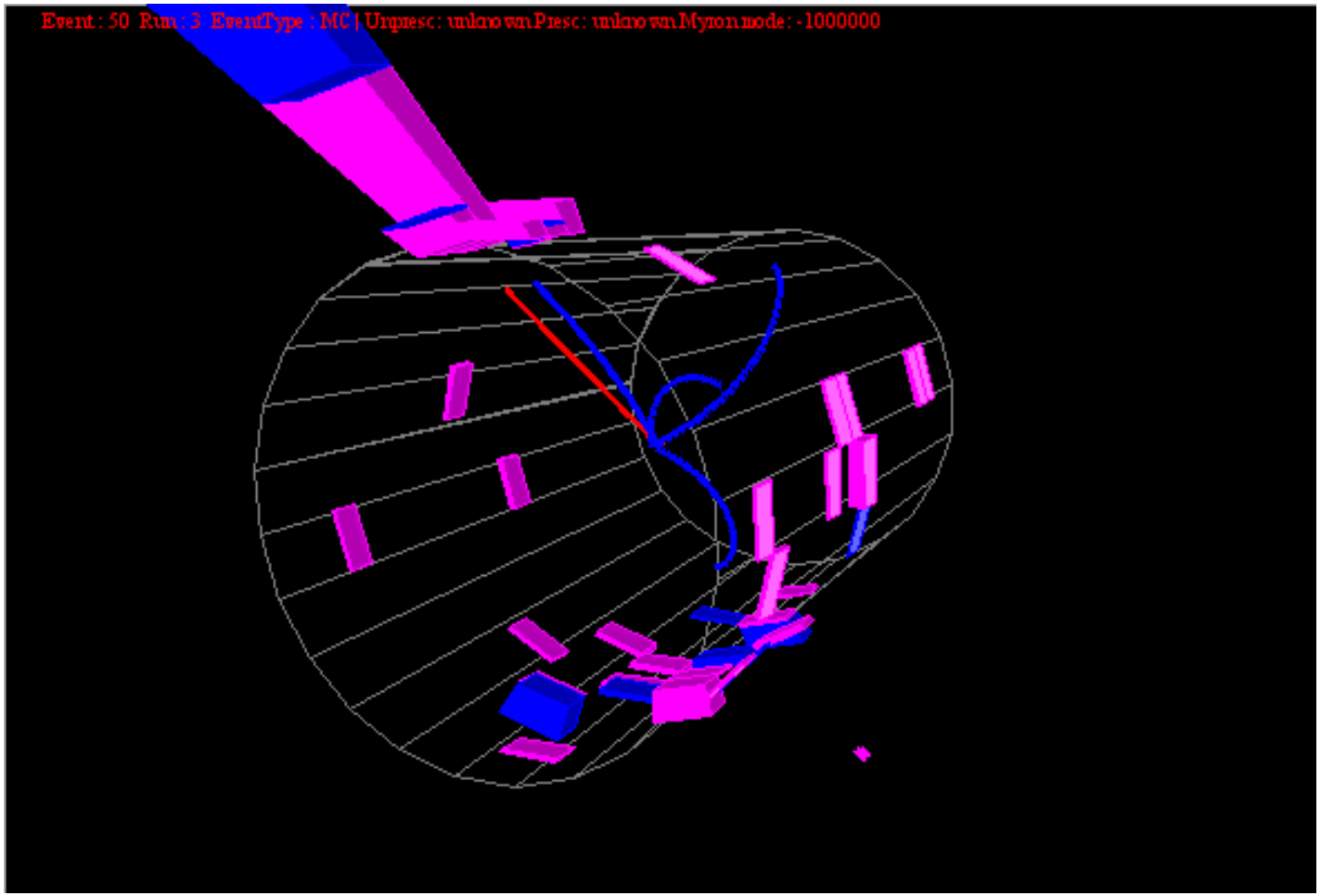
root [10] K0S -> pi+ pi-
Kinematics
Mass : 0.4944
Px : -0.5272
Py : -8.6768
Pz : -1.8739
Pt : 8.6928
Rapidity : -0.2138
Vertex
-0.2839 +- 0.0085
-4.2742 +- 0.3601
-2.0875 +- 0.1438
K0S -> pi+ pi-
Kinematics
Mass : 0.4944
Px : -0.5272
Py : -8.6768
Pz : -1.8739
Pt : 8.6928
Rapidity : -0.2138
Vertex
-0.2839 +- 0.0085
-4.2742 +- 0.3601
-2.0875 +- 0.1438



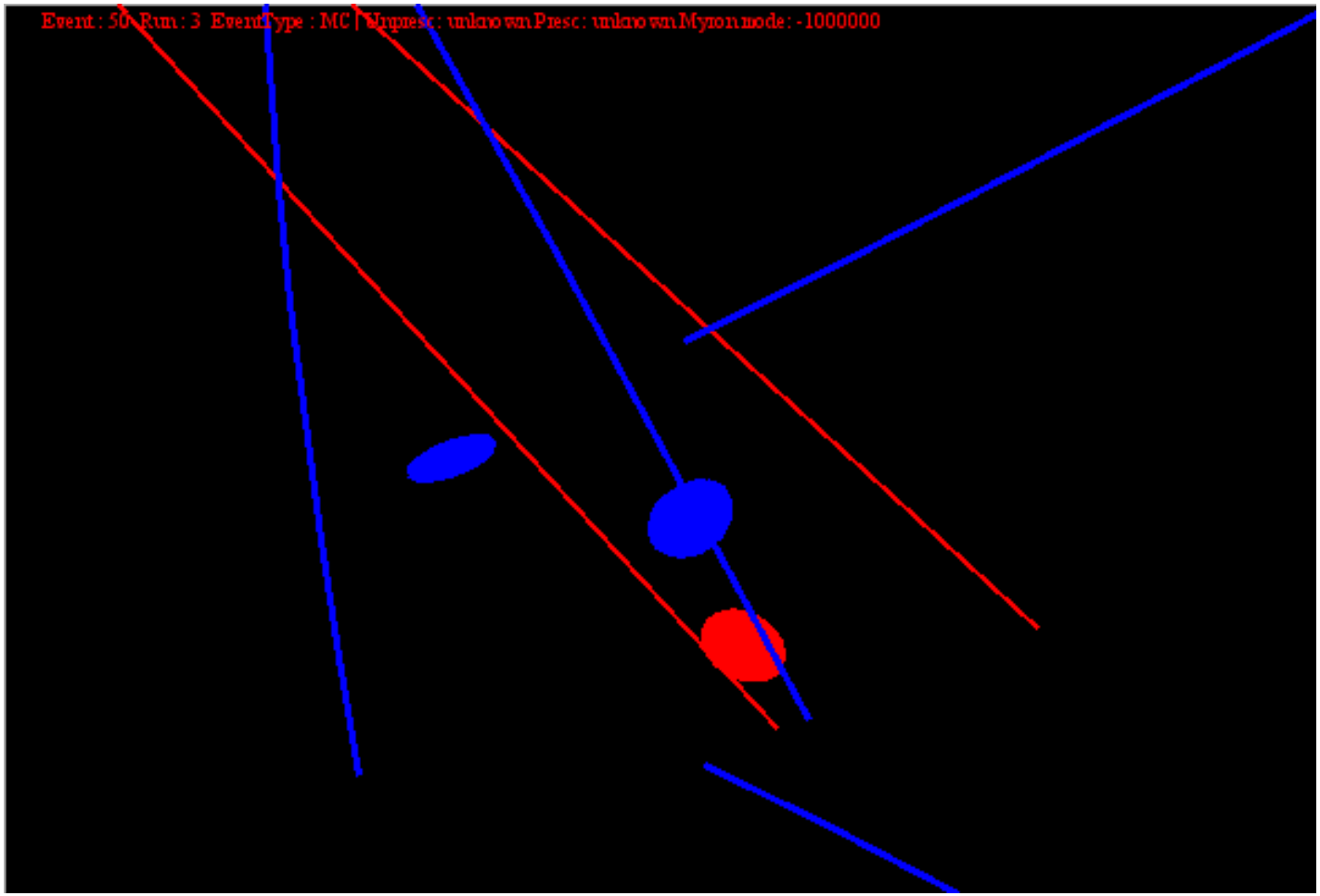
Closer Look on Vertices



3D Variant


Event : 50 Run : 3 EventType : MC | Unpresc: unknown Presc: unknown Myon mode: -1000000

Blow up of IP


Event : 50 Run : 3 EventType : MC | Nrpresc : unknown Presc : unknown Myon mode : -1000000

How to Select a Decay Chain

- From Root prompt: *load_lib();*
- Then any of the following functions may be envoked

- *sel(const char* name, Color_t c=2, Width__t w=2, const char* opt=“”);* selects MC particle *name* and all its decay products
- *Sel(Int_t n, Color_t c=2, Width_t w=2, const char* opt=“”);* selects MC particle with OBSP number *n*
- *selPdgCode(Int_t n, Color_t c=2, Width_t w=2, const char* opt=“”);* selects particle with PdfCode *n*
- *selCdfCode(Int_n, Color_t c=2, Width_t w=2, const char* opt=“”);* by CDF code
- *unsel()* brings back default colors

Selected decay chains

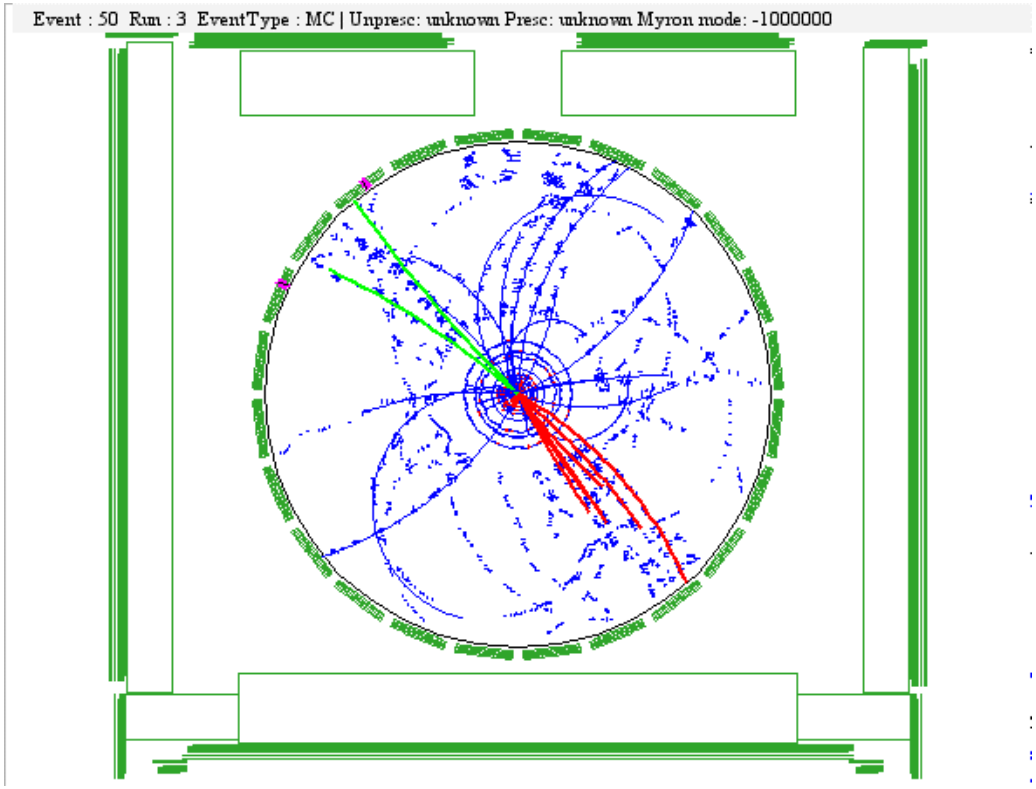
root [23] sel("B");

Bu- (44) -> D+ (127) Pi- (128) Pi+ (129) Pi- (130) Pi- (131) gamma (132) gamma (133)

Bd0 (61) -> K0S (136) Mu+ (137) Mu- (138)

found 2 B

root [24] sel("Bd0",3,2);

Bd0 (61) -> K0S (136) Mu+ (137) Mu- (138)

found 1 Bd0