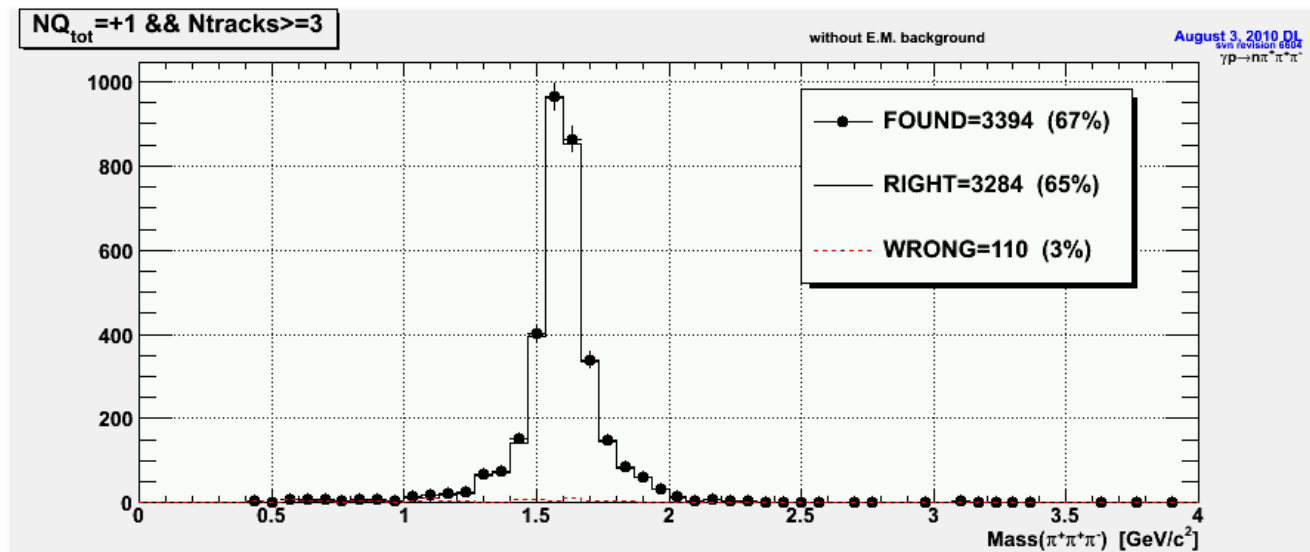
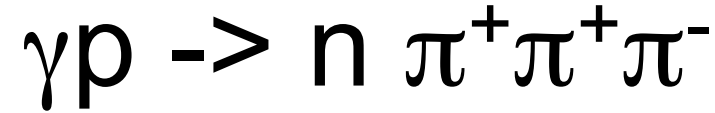


$\eta \pi^+ \pi^+ \pi^-$

David Lawrence, JLab

Aug. 16, 2010

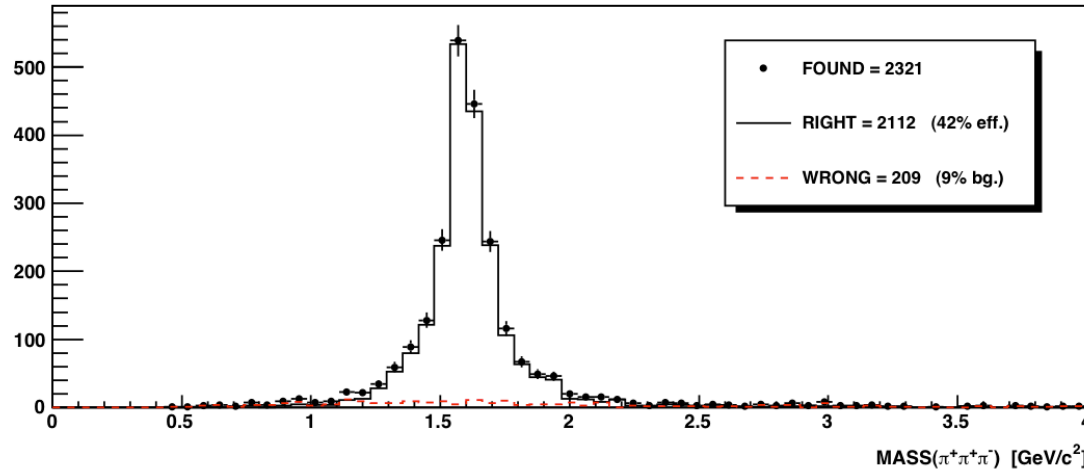




with 10^7 tagged γ /s EM background

No cuts

Jake's plot (from fig. 1 of document at 8/2/2010 meeting)



FOUND:

- ≥ 3 charged tracks
- Total charge = +1

RIGHT:

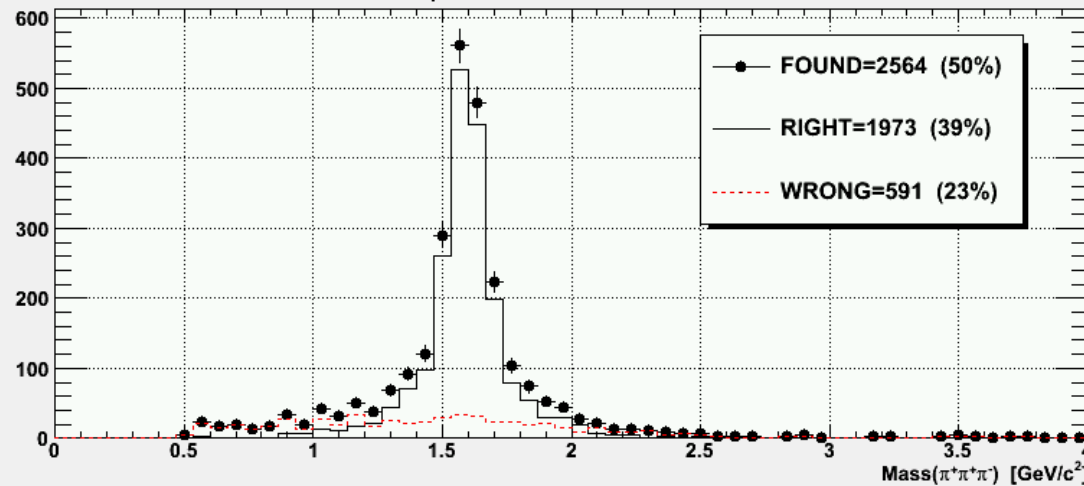
- $2 \pi^+$
- $1 \pi^-$
- 0 proton

$NQ_{tot} = +1 \ \&\& \ Ntracks \geq 3$

Dave's plot

with E.M. background

August 3, 2010 DL
svn revision 6802
 $\gamma p \rightarrow n \pi^+ \pi^+ \pi^-$



(ignore the "WRONG" values)

For events with no EM background, the percentage of "RIGHT" events is 65%

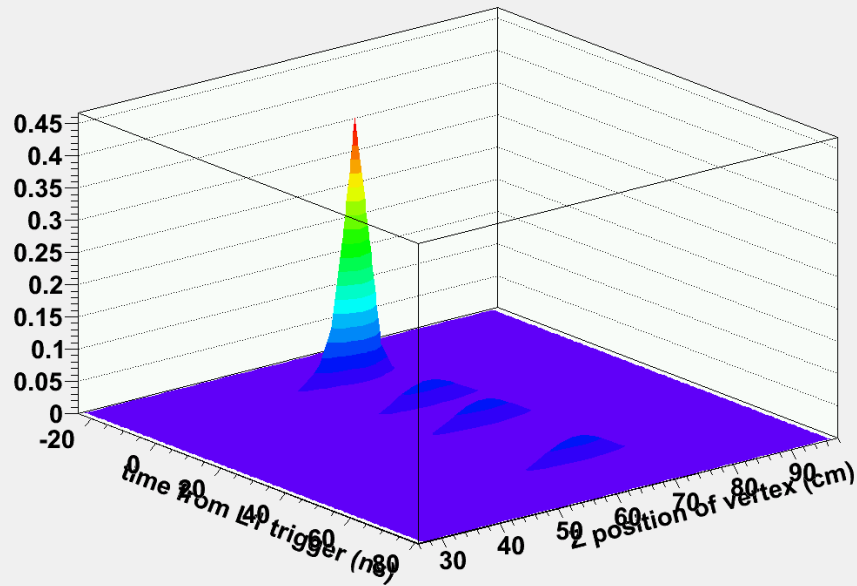
DPhysicsEvent class

- The DPhysicsEvent objects hold the best-guess reconstructed particles that appear to have come from the same physics event
- Multiple physics events may be contained in a single DAQ event

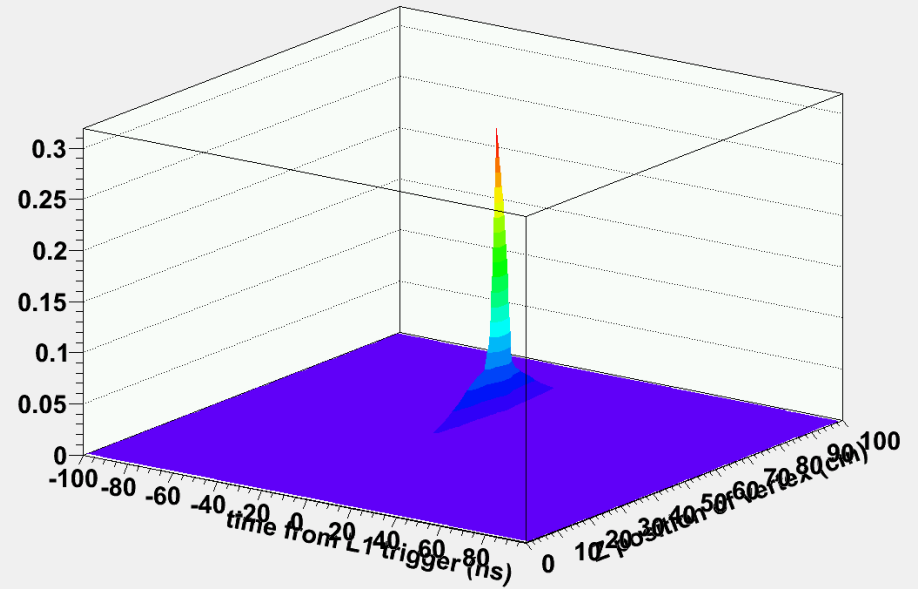
```
30 class DPhysicsEvent:public jana::JObject{
31     public:
32         JOBJECT_PUBLIC(DPhysicsEvent);
33
34         const DVertex* vertex;           // vertex
35         vector<const DPhoton*> photon;    // photons
36         vector<const DTrackTimeBased*> pip; // pi+
37         vector<const DTrackTimeBased*> pim; // pi-
38         vector<const DTrackTimeBased*> proton; // proton
39         vector<const DTrackTimeBased*> Kp; // K+
40         vector<const DTrackTimeBased*> Km; // K-
41         vector<const DTrackTimeBased*> otherp; // other positively charged tracks (positrons?)
42         vector<const DTrackTimeBased*> otherm; // other positively charged tracks (anti-protons?)
43
44         // There is too much info to fit on a single line here so
45         // we limit toStrings to just saying how many of each type
46         // of particle is here. For anything else, the id values
47         // for each particle should be kept at least.
48         void toStrings(vector<pair<string,string> > &items)const{
49
50             //AddString(items, "x", "%3.2f", vertex->x.X());
51             //AddString(items, "y", "%3.2f", vertex->x.Y());
52             //AddString(items, "z", "%3.2f", vertex->x.Z());
53             AddString(items, "Nphoton", "%d", photon.size());
54             AddString(items, "Npi_plus", "%d", pip.size());
55             AddString(items, "Npi_minus", "%d", pim.size());
56             AddString(items, "Nproton", "%d", proton.size());
57             AddString(items, "NK_plus", "%d", Kp.size());
58             AddString(items, "NK_minus", "%d", Km.size());
59             AddString(items, "Nother_plus", "%d", otherp.size());
60             AddString(items, "Nother_minus", "%d", otherm.size());
61         }
62     };
```


Distributions in z vs. t at vertex

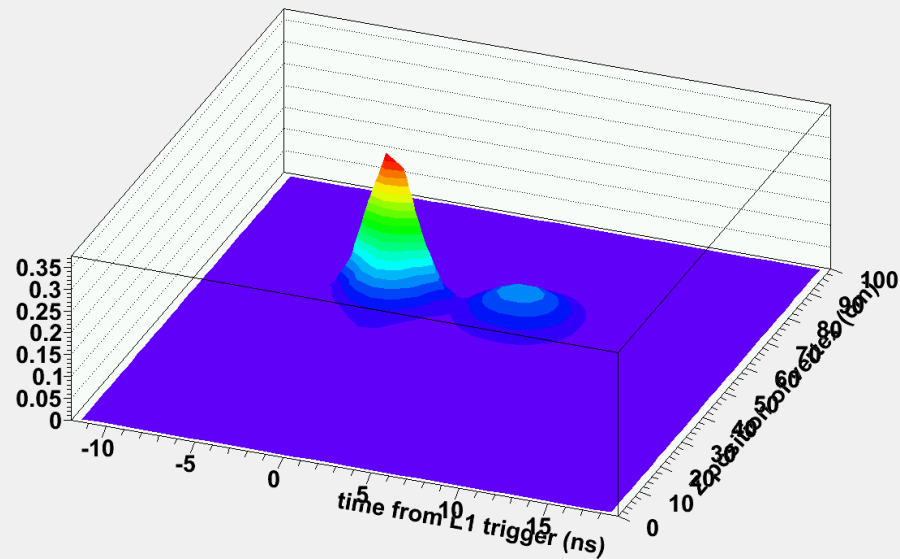
Copied from DHoughFind object



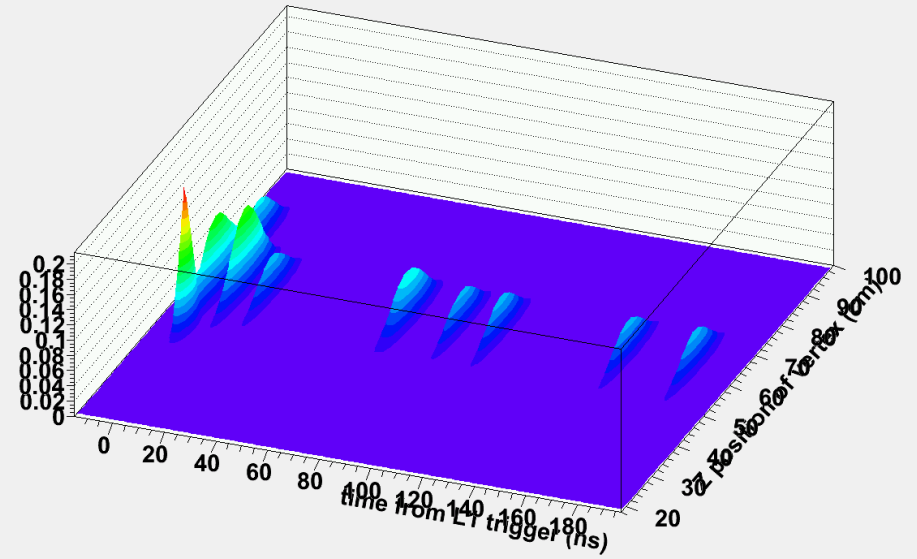
Copied from DHoughFind object



Copied from DHoughFind object



Copied from DHoughFind object



Noisy event

Source: hdgeant_smeared.hddm

Hall-D Event Viewer

View Controls: -X, X+, -Y, Y+, -Z, Z+, ZOOM, Transverse Coordinates (x/y, r/phi), Reset

Event Controls: <-- Prev, Next -->, continuous, delay: 0.25

Info: Run: -----, Event: 7

Inspectors: Track Inspector, Quit

Track Draw Options: DTrackCandidate, DTrackWireBased, DTrackTimeBased, DChargedTrack, DPhoton, DMCThrown, DMCTrajectoryPoint

Hit Draw Options: CDC, CDC Drift Time, CDCTruth, FDC Wire, FDC Pseudo, FDCTruth, TOF, TOFTruth, FCAL, BCAL, More options

Track Info

Thrown						Reconstructed								
trk:	type:	p:	theta:	phi:	z:	trk:	type:	p:	theta:	phi:	z:	chisq/Ndof:	Ndof:	FOM:
1	pi+	1.693	21.38	5.984	65	1	pi-	3.664	4.496	5.806	62.38	108.1	32	0
2	pi-	2.968	4.483	5.869	65	2	pi+	4.193	5.742	2.845	62.76	1.214	17	0.136966
3	pi+	4.198	5.869	2.855	65	3	proton+	2.893	8.644	2.748	80	4761	43	0
4	neutron	0.5091	55.52	2.766	65	4	proton+	0.4733	5.683	3.764	80	100.3	29	0
-----	-----	-----	-----	-----	-----	5	pi+	2.645	17.13	6.081	50	101.7	18	0
-----	-----	-----	-----	-----	-----	6	proton+	2.539	17.2	6.071	50	98.13	18	0

DTrackTimeBased: [Dropdown]

Full List

Next steps...

- The DPhysicsEvent method, while gaining back some events, still doesn't solve the discrepancy between the with-background (~40%) and without-background (~65%) data sets. More study is needed.
- The *phys_tree* plugin has been updated to use DPhysicsEvent