MC generation for the B group

- Realistic MC production update;
- Bookeeping
- Remind of MC production “flow”
- Plan: requested samples
- Developments:
  - SAM-store
  - Filters
  - Hand-made searchable database
- Problem report

Monte Carlo samples for B-group

Update on Statistics for > 4.10.0int3:

- Number of official samples: 50
- Number of events simulated: 44'674'605
- No. of events produced and stored to disk: 13'939'847
- Most samples are on CAF server only fcdfdata032
- 14 bigger samples are on DFC, available via dCache.
- List available from web page

http://www-cdf.fnal.gov/internal/physics/bottom/realisticMC/available_samples.html

http://www-cdf.fnal.gov/internal/physics/bottom/realisticMC/available_samples.html

- Follow the links for full information on the samples
- Look also for the filtered samples, when available.

All the above sample produced in Glasgow (cdfg/scotgrid)

Status of the Realistic Monte Carlo for the B group

Available samples:

(scroll down to the bottom for the most recent)

Link to the samples for winter02 analyses

Link to the samples for winter03 analyses

Samples for summer analyses

total number of simulated events: 44'674'605
total number of produced events: 13'939'847

no.	Physics	Decay	Release	Gen.	Ut evt	GenFilter	# Generated	sigma (ub)	# Simulated	# TrigSim	# L2 Filter	# Production	Available	tcl	tcl+log	valid
33	B+/-	J/Psi K	4.10.0int3	Bgen	---	2TT	1.0M	---	482110	482110	20151	20151	mbot293CAF	sim prd trg	sim+prd+trg	yes,ncu
34	B+/-	J/Psi(ee) K	4.10.0int3	Bgen	---	2TT	5.0M	---	2330581	2330581	41675	41675	mbot294CAF	sim prd trg	sim+prd+trg	yes,ncu
34b	B+/-	J/Psi(ee) K	4.11.0	Bgen	---	2TT	300k	---	157859	157859	4890	4890	mbot295CAF	sim prd trg	sim+prd+trg	yes,ncu
35	B mix	Any	4.11.0	Bgen	---	2TT	10M	---	405215	405215	13760 mbdy 1595 pipi	405215	mbot300CAF	sim prd trg	sim+prd+trg	r/o p
36	B mix	Any	4.11.0	Bgen	---	2TT	10M	---	421368	421368	11835 mbdy 1186 pipi	421368	mbot306CAF mbot27 DFC	sim prd trg	sim+prd+trg	??

Long sample description Link ! !

Ordinal number

Decay table (link ! !)

Generation release

Generator

Filter at generation level

Cross section (Pythia only)

Additional filter if available

Sample ID's:
-internal name mbot3xx
-DFC name mbot##

Validation

Tcl AND log files

Monte Carlo samples for B-group

Structure of realistic B-MC :

- Step 1
  - Generation (Only Pythia and Bgenerator used to now)
  - Simulation with Silicon clustering

  } cdfSim
- Step 2
  - Trigger Simulation TRGSim++ 4.9.1hpt3
- Step 3
  - svtfilter or Prereq
  - Production

  } ← Use mcProduction here

Tcl files are produced the same way as in standard MC, but number of events and run number change:

We use script ./multirun.pl with input a list of runs. Number of events per run proportional to run off-line luminosity.

Input: total number of events, max events per job (Filter included !)

>= 1 job per run number

Tar file available from fcdflnx2:/cdf/scratch/dauria/jim_submit

Monte Carlo samples for B-group

Plan:

- Generic samples:
  - At least 2 big samples requested: hadronic and l+svt details to be defined, also a J/Ψ big sample requested.
- Inclusive samples
  - J/Psi X with Pythia, using QCD generation (msel 1)

    This is anticipated to be very cpu-intensive at generator level.

    Tests are in progress.
- Single-channel decay many samples, including charm. Partial list:
  - B0 → D+ π -
  - Bs →Ds π
  - B+ → J/Ψ K+
  - D+ → K π π, KK π, π π π ← charm has low trigger efficiency.

Monte Carlo samples for B-group

Parameters that change between jobs:

- Run number
- Number of events
- Run sections: present scheme uses progressive run section number for each run number (see next slide)
- Event number offset.
- Random seeds

Job summary file of multirun.pl

Run	Events	RS
155895	356823	
156484	343589	
161379	392164	
161678	381181	
162423	405407	
162480	371038	
162498	441078	
162631	444612	
162857	338919	
163064	525183	

Job	Run no.	RS	Events	Offset	tcl-file
100	155895	1	16219	16219	394/runMC394_100.tcl
101	155895	2	16219	32438	394/runMC394_101.tcl
102	155895	3	16219	48657	394/runMC394_102.tcl
103	155895	4	16219	64876	394/runMC394_103.tcl
104	155895	5	16219	81095	394/runMC394_104.tcl
105	155895	6	16219	97314	394/runMC394_105.tcl
106	155895	7	16219	113533	394/runMC394_106.tcl
107	155895	8	16219	129752	394/runMC394_107.tcl
108	155895	9	16219	145971	394/runMC394_108.tcl
109	155895	10	16219	162190	394/runMC394_109.tcl
110	155895	11	16219	178409	394/runMC394_110.tcl
111	155895	12	16219	194628	394/runMC394_111.tcl
112	155895	13	16219	210847	394/runMC394_112.tcl
113	155895	14	16219	227066	394/runMC394_113.tcl
114	155895	15	16219	243285	394/runMC394_114.tcl
115	155895	16	16219	259504	394/runMC394_115.tcl
116	155895	17	16219	275723	394/runMC394_116.tcl
117	155895	18	16219	291942	394/runMC394_117.tcl
118	155895	19	16219	308161	394/runMC394_118.tcl
119	155895	20	16219	324380	394/runMC394_119.tcl
120	155895	21	16219	340599	394/runMC394_120.tcl
121	155895	22	16224	356818	394/runMC394_121.tcl
122	156484	1	16361	16361	394/runMC394_122.tcl
123	156484	2	16361	32722	394/runMC394_123.tcl
124	156484	3	16361	49083	394/runMC394_124.tcl
125	156484	4	16361	65444	394/runMC394_125.tcl

New run number

Run section reset

Monte Carlo samples for B-group

Developments:

- Smart filters required to improve efficiency
  - Tested first example from S. Giagu (charm cuts in d0) DstarHEPGFilter
- Use SAM to store files and to make bookeeping.
  - Python file changed: metadata description to be improved
  - 2 samples stored in SAM. Magical !
  - Issues on how to store automatically MC info to Sam Metadata. Source: logfile ? Parser ? AC++ framework ?
- Move from web page to searchable database:
  - First steps taken: number of events is now tagged and searched by a perl script, updated daily .
  - Do the same for web page "entries" → web-based database (XML ?) If cgi-bin available on cdfsga web interface ready next week.
  - Automatic generation of web page by job submitter.

```
<TR>
   <th> 67          </th>
   <th> Bs/BsB      </th>
   <th> <a href="dbt/Bs_PhiPhi.DEC">Phi Phi</a>    </th>
   <th> 4.11.2      </th>
   <th> BGen        </th> <generator>
   <th> --          </th>
   <th> Lowpt       </th>
   <th> 300k        </th> <ngen>
   <th> ---         </th>
   <th>  260260     </th> <nev>
   <th>  260260     </th>
   <th><i>
<a href = "380mbody.txt"> mbdy</a>
<a href = "380lowpt.txt"> 11698_lowpt</a>
</i></th>
   <th>  260260     </th> <prod>
   <th> <a href="380.txt">m380</a>
<a href="http://cdfdbb.fnal.gov:8520/cdfr2/databases/?type=dc-dsl&do=r&nsrc=rp&\
fsrc=fp&gsrc=fp&dcbk=CDFPBOT&dsid=mbot0c&dslorder=%2Bdstxt">
<font color=red>mbot0c DFC</font></a></th>
   <th>sim prd trg</th>
   <th><a href="runMC380.log.txt">sim+prd+trg</a>  </th>
   <th> good        </th>
 </TR>
```

Tags to search on

Working on making this entry generated automatically by submitter
Or by book keeping job.

0	100	156484	14509	3182	3182	141	0
1	101	156484	14509	3242	3242	111	0
2	102	156484	14509	3231	3231	91	0
3	103	156484	14509	3250	3250	117	0
4	104	156484	14509	3230	3230	119	0
5	105	156484	14509	3238	3238	104	2
6	106	156484	14509	3247	3247	108	0
7	107	156484	14509	3263	3263	107	0
8	108	156484	14509	3168	3168	106	2
9	109	156484	14509	3301	3301	107	0
10	110	156484	14509	3290	3290	126	0
11	111	156484	14509	3224	3224	99	0
12	112	156484	14512	3242	3242	118	0
13	113	161379	14352	3202	3202	113	0
14	114	161379	14352	3225	3225	128	2
15	115	161379	14352	3212	3212	122	0
16	116	161379	14352	3191	3191	99	2
17	117	161379	14352	3259	3259	97	0
18	118	161379	14352	3264	3264	112	0
19	119	161379	14352	3200	3200	114	0
20	120	161379	14352	3162	3162	109	0
21	121	161379	14352	3238	3238	103	0
22	122	161379	14352	3236	3236	114	0

Job number

tcl number

Run number

Generated events

simulated

Trigsim events

produced

Number of crashes
(includes TRGSim++)

Monte Carlo samples for B-group

SAM interlude:

- how to store automatically MC info to Sam Metadata (aka python file)

Manual interventions means mistakes:

bad info worst than no info

Possible Sources:

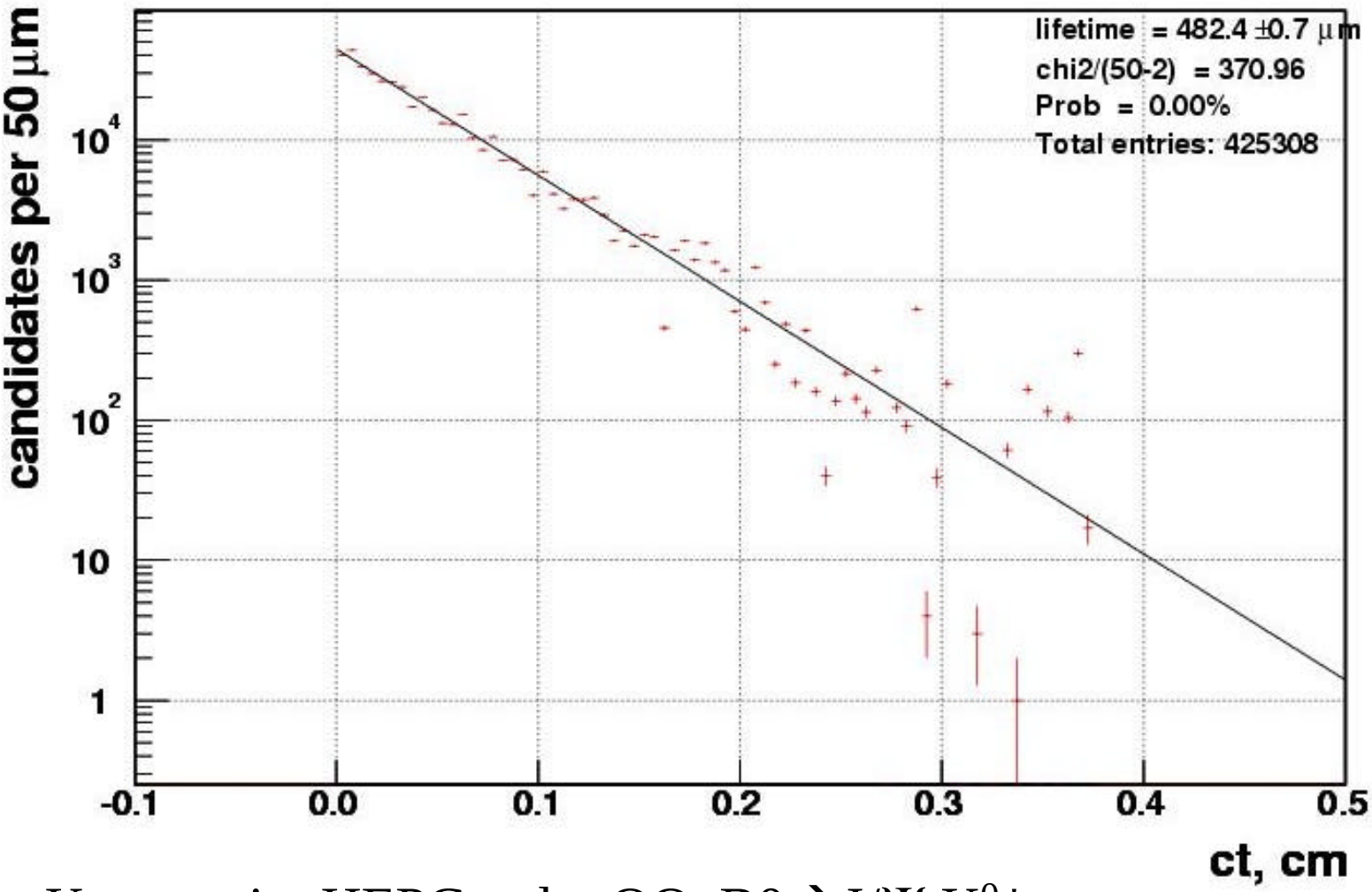
- Tcl file ?
  - -how to store and make searchable the default parameters
  - -Maintain parameters from ALL packages
- logfile
  - - feasible, but need a parser, and “show” statements in tcl
- AC++ framework ?
  - - my preferred option: store in human readable format ALL parameters of modules used in job.

Monte Carlo samples for B-group

Problem report:

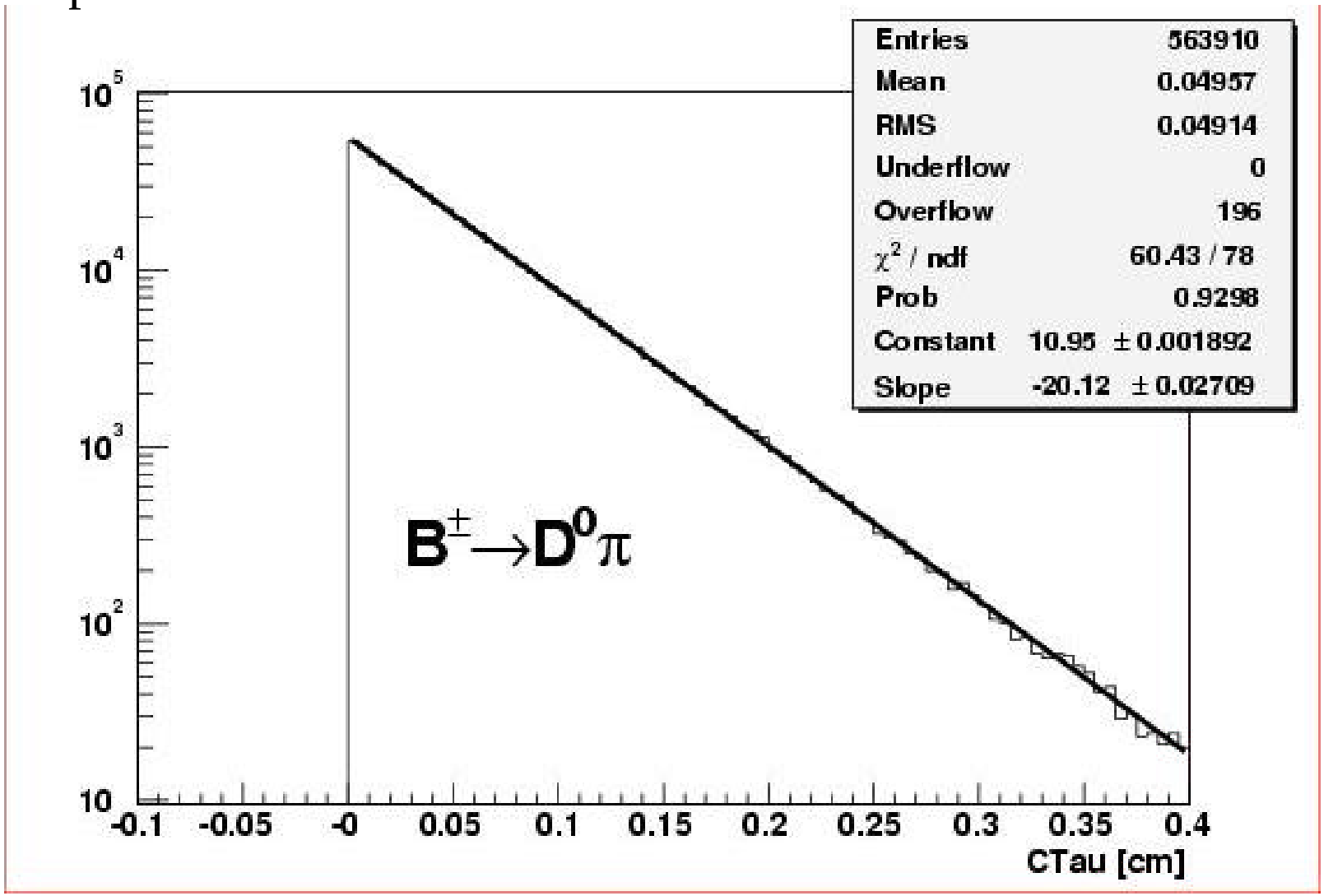
- QQ decayer has bad behaviour in 4.11.2 for lifetimes.
- EvtGen is ok ~~ ??.
- HepgFilter had limit to pdg < 10000 (excluding D1 (aka 1P10))
- Mass width of charm mesons (D1, D2) being assessed (4.11.2)
- Bgenerator 5.2.0 crashes (random numbers)

Problems with QQ 4.11.2



From Konstantin. HEPG only, QQ, B0→J/Ψ K^{0*}

No problem with EvtGen 4.11.2



From Kim Giolo, $B^+ \rightarrow D^0 \pi^+$, EvtGen HEPG level only.

Mario Spezziga reports problems with EvtGen for B0 to J/Psi K