Status of WW Monte Carlo

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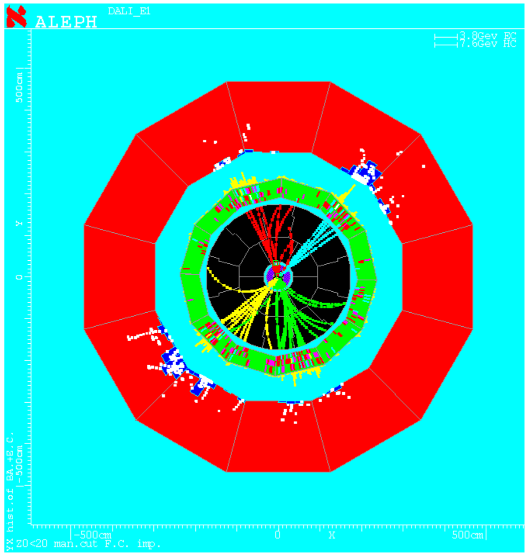

OUTLINE:

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Introduction

Since January 2000 the W Group MC requirements have been co-ordinated by a W Group contact:

- Collect requests from the W Group for productions and send these requests to homelabs.
- On completion of production, verify that the samples arriving at CERN (MINIs, POTs) are as expected.
  (Tape book-keeping, check software versions, seeds, operating systems, etc...)
- Prepare listings of MC descriptions and tapes for Scanbook and send them to ALPROD/Scanbook.

Priority: Scanbook is as up-to-date and reliable as possible.
(Information is *not* maintained on the Web any more).
If you are looking for MC
Look in Scanbook (hot new Java version!)...
...or contact me to find out status.

1998 (189 GeV) MC - Known Problems - GHEISHA

Summary of ALNEWS from Jacques Boucrot 3-APR-2000 in ALEPH.OFFLINE

GHEISHA bug (in GEANT):

- Discovered by Andrea Venturi, Nov 1999.
- Incorrect treatment of Fermi motion inside nuclei in GHEISHA, the hadronic shower simulation package of GEANT.
- In ALEPH, caused distribution of HCAL clusters to be systematically generated at larger ϕ (15 mrad on average).
- Corrected in official GEANT v312.13, propagated to GALEPH v308.2 (16 Nov 1999).
- GALEPH versions are in Scanbook.
  If Scanbook 'Condition Explanation' includes 'NEW'
  then it's free of the GHEISHA bug.

1998 (189 GeV) MC - Known Problems - HMROAD

Continued summary of ALNEWS from Jacques Boucrot 3-APR-2000 in ALEPH.OFFLINE

HMROAD bug (in JULIA):

- ◇ Discovered by Andrea Sciaba, Feb 2000.
- ◇ Affects digital hits in HCAL endcaps:
  digital pattern is used for Muon ID.
- ◇ Bug fixed in JULIA 312.0 (released 4th April 2000).
- ◇ Impact of bug different on different operating systems:
  - No effect on MC produced on HP's
  - Does effect (a) real data and
    (b) all MC with JULIA 302-311 on DEC OSF1 or Linux.
- ◇ Operating system information is not in Scanbook.

This motivated the labelling of 189 GeV Linux productions in my last MC status report on 16 Feb 2000.

1998 (189 GeV) MC - Known Problems - HSLINK

Continued summary of ALNEWS from Jacques Boucrot 3-APR-2000 in ALEPH.OFFLINE

HSLINK bug:

- ◇ Detected by comparisons of MC produced on different operating systems.
- ◇ Origins understood at end of March 2000 by David Smith and Marco Cattaneo.
- ◇ Affects only MC produced on HP machines with JULIA v309, v310, v311.
- ◇ Anomalous behaviour of HSLINK routine in JULIA, when compiled on HP machines using certain compiler options.
  - OK when compiled on DEC OSF1 or Linux!
  - Can be solved on HP by compiling with a new FORTRAN compiler patch.
- ◇ Affects θ distribution of Eflow objects of Type 5 (hadronic neutral residual energy). Energy fraction is $\sim 3\%$ lower in Endcap B w.r.t. Endcap A.
  $\Rightarrow$ Possible forward-backward fake asymmetry.

Effect on W physics studies not known.
Have checked operating systems for you again though...!

189 GeV Reference Sample

Approximately 41.5% of the reference MC has possible HSLINK problem:

Run Range	Ngen	Op.Sys.	Julia	Comment
104-154	107995	HP	308.6	
226-316	199997	HP	308.6	
404-444	199990	LINUX	308.6	
506-546	99999	HP	308.6	
717-827	431242	HP	309.0	HSLINK
	1039223			

189 GeV Off-Peak W Mass Samples

Although the off-peak W masses were produced on HP,
the JULIA version was not yet 309.0:

Wmass	Run Range	Op.Sys.	Julia	Comment
79.35	446-466	HP	308.6	
79.70	806-826	HP	308.6	
79.85	326-346	HP	308.6	
80.10	386-406	HP	308.6	
80.25	746-766	HP	308.6	
80.45	716-736	HP	308.6	
80.60	416-436	HP	308.6	
80.85	356-376	HP	308.6	
81.00	776-796	HP	308.6	
81.35	476-496	HP	308.6	

$\Rightarrow$ Off-peak W mass samples *not* affected by HSLINK problem.

189 GeV JETSET and HERWIG samples

	JETSET		HERWIG		
Ngen	Run No.	Op.Sys.	Run No.	Op.Sys.	Scanbook?
200k	616-706	HP+J308.6	616-706	HP+J308.6	No
100k	837	HP+J309.0	847	HP+J309.0	Yes
50k	857	HP+J309.0	957	LINUX	Yes
32.2k	867	HP+J309.0	967	LINUX	Yes
50k	877	HP+J309.0	977	LINUX	Yes
50k	887	LINUX	987	LINUX	Yes
50k	897	LINUX	997	LINUX	Yes
50k	907	LINUX	1007	LINUX	Yes
100k Crete	100-1000	HP+J309.0	110-1010	HP+J309.0	No

$\Rightarrow \simeq$ 132.2k of the JETSET/HERWIG samples have been produced with each fragmentation on a different platform!
$\Rightarrow$ Take care with systematics!

Some of the 189 GeV Colour Reconnection Samples

In the following samples, a KORALW 4-fermion 100k set of generated four-vectors is fragmented via different models...

The Kingal Code and a bit of the Condition Explanation are given in the table to help you find the sample in Scanbook.

Run 1 is a statistically independent sample from Run 2.

Condition Explanation	Run 1 (50k)	Run 2 (50k)	In Sbook?	Kingal Code
...Jetset FOR REFRAG STUDIES	887	897	Yes	5035
...Refrag Ariadne Standard	1777	1787	Yes	5035
...Refrag Ariadne AR2	1677	1687	Yes	5035
...Refrag Herwig Standard	987	997	Yes	5135
...Refrag Hrwg+okCR+goodVMIN2(0.1)	117	127	Nearly	5135

Status of 189 GeV WW MC in Scanbook

- Almost up-to-date! But some tidying up to do...
- Include 200k of JETSET/HERWIG events from RAL.
- Most recent unbugged Herwig+CR samples to be sent to Scanbook.
- Better description of refragmented samples...
  Need run number relationships between samples of different fragmentations (not currently implemented).
- Slight modifications to explanations to help the user.

1999 MC 192-202 GeV

- Status has not changed much since 16th Feb status report.
- Some POTs to be sent to Scanbook, but all MINI's are there!
- Some New samples produced by RAL for W Width Studies...
  where W mass *and* W width moved from central values.
  The MINI's are in Scanbook!

W Mass (GeV)	W Width (GeV)	Quantity
79.85	1.5	50k
79.85	2.7	50k
80.85	1.5	50k
80.85	2.7	50k

- Thorough survey of operating systems not yet done.
  (Although we know none of the NEW 1999 MC was produced on Linux).
  A very time-consuming and tedious task...
  would like some feed-back from 189 GeV studies, to know if it's worth it...

1999 (192-202 GeV) 4f KINGAL stock

Over the past $\simeq$ 5 weeks, 4-fermion KINGAL stock has been built...
Notation 'KA-100k' means 100k standard events are refragmented with KinAgain.

KINGALers	191.6 GeV	195.5 GeV	199.5 GeV	201.6 GeV
Peter Negus (RAL)	300k	300k 400k 2×100k Off-peak	300k 400k 2×100k Off-peak	300k
Patrice (Saclay) +Djamel +Marie-Claude	600k	800k KA-400k HWG KA-100k HWG+CR	600k KA-400k HWG KA-100k HWG+CR	300k
Stephane		200k KA-100k BECeachW KA-100k BECall	200k KA-100k BECeachW KA-100k BECall	
Total Reference Total Calibration Total KAGAIN	900k	1200k 200k 1200k	1000k 200k 1200k	600k
Total	900k	2600k	2400k	600k

GRAND TOTAL = 6.5 Million Events!

1999 (192-202 GeV) 4f KINGAL stock - To Do

Some holes to fill...

- ◇ 300k at 201.6 GeV for the Reweighting Reference.
- ◇ 200k at 199.5 GeV for the Reweighting Reference.
- ◇ More/other refragmentations

Rough guesses at timescales...

- ◇ Jorgen-Beck in Copenhagen, Linux, $\simeq$ 120k WW/day.
- ◇ HP's at RAL being phased out, Linux coming in
  Similar rate to Copenhagen.
- ◇ Saclay, 50k WW/day?
- ◇ Assume time lost in setting up, production inefficiency, data transfer etc. etc. is gained by supplementary production elsewhere (Lyon, Pisa...)
- ◇ $\simeq$ 2M/week, so 7M in $\sim$4 weeks.
- ◇ Easter Holidays etc, so more like $\sim$5 weeks.
- ◇ Marcello doing final checks with Julia 312.0

Conclusions

- You should be aware of known MC problems and investigate them if they might affect your studies.
- Jason $\rightarrow$ Scanbook is your primary database tool!
  Web information is not maintained.
  Please use Scanbook - if it confuses you or omits information contact me!
- Please inform me of any further MC requirements.
- Large ($\simeq$ 7M WW events) 1999 MC production imminent.