



Cosmic Slice & M6

A. Cerri for the Cosmics and Tracking Triggers folks



Cosmics Slice Status

- Migration to “modern configuration”
 - Configurables
 - New trigger JO framework
 - Full re-write of the slice completed
 - Extensive testing under way
 - ATN Nightly tests (x9) in place
- Most recent use cases:
 - SCT(+TRT) week
 - Muon (“P3”) week (ongoing - only dummy algos in for the time being)

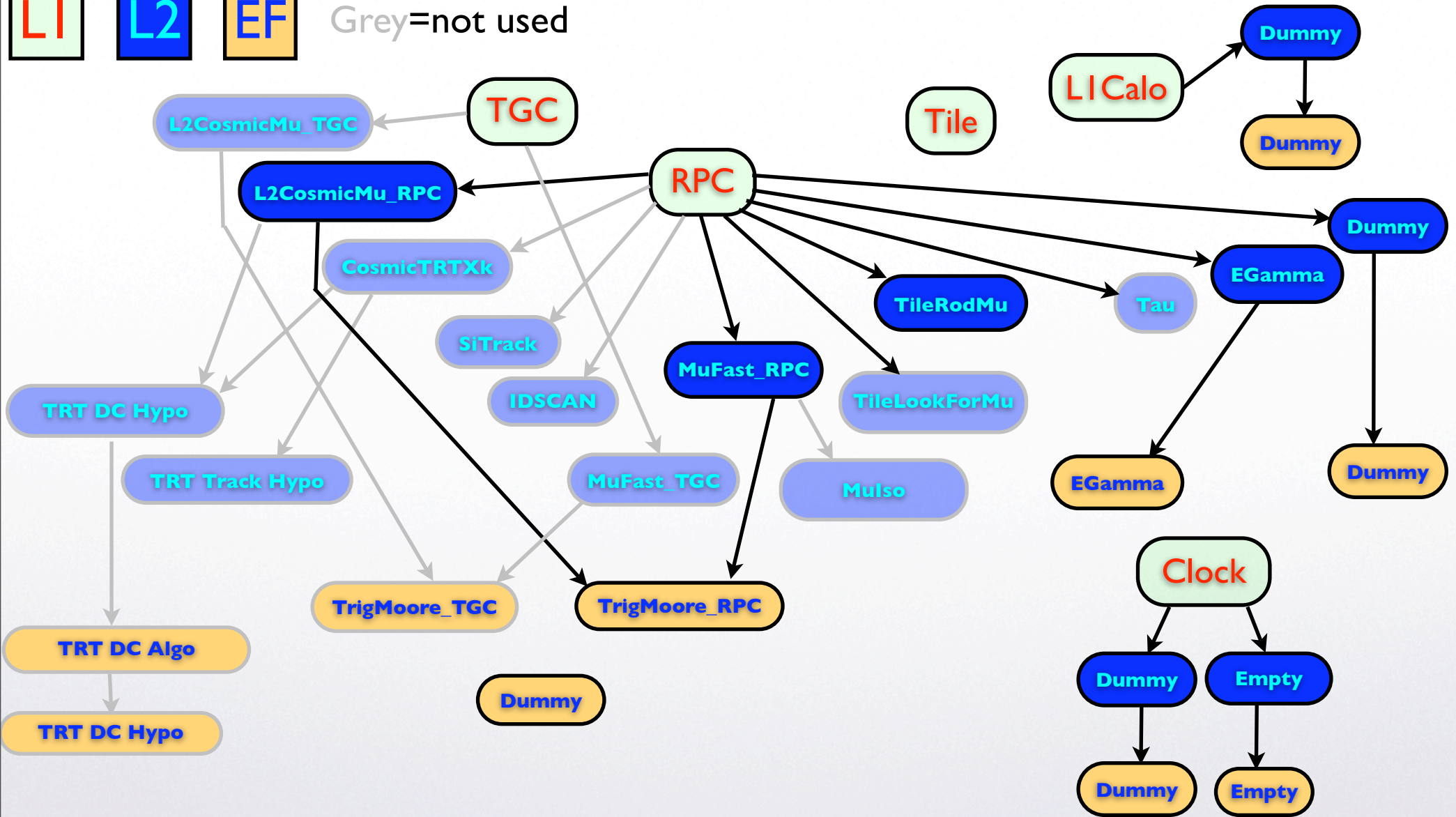


L1

L2

EF

Grey=not used





Features

- 53 LI+EF chains
 - 10 “service”
 - 7 Tracking (SiTrack, IDSCAN)
 - 6 TileCal
 - 5 EGamma + Jet/Tau/Calo
 - 5+5 Muons (CosmicMuon, muFast, Moore x TGC/RPC)
 - 4 MEt
 - 2 MinBias
 - 1 Calibration Stream
- Configurable LI input signature
- Configurable output stream (merging chains with same LI signature by default)

New ROD Firmware, ID matching, muon matching

Now using only 2 instances (TGC/RPC) of muFast

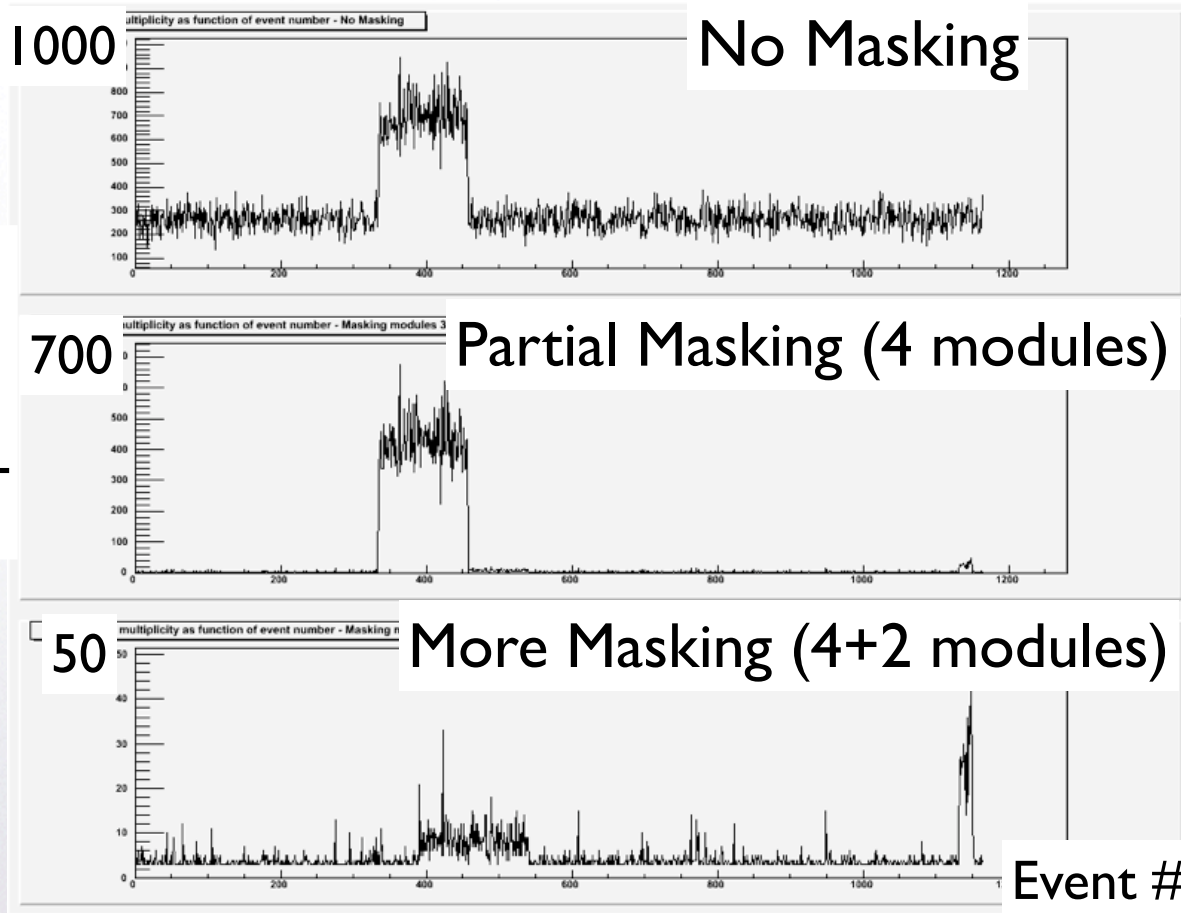


Use Cases & Performances



SCT Cosmics

Laura Maria Gonzalez Silva & Jamie Boyd



- SCT performances **not final!**
- Noisy modules hide signal
- Masking using JO (thanks to M. Sutton)
- After masking find 25 tracks offline
- Some decoding errors present:

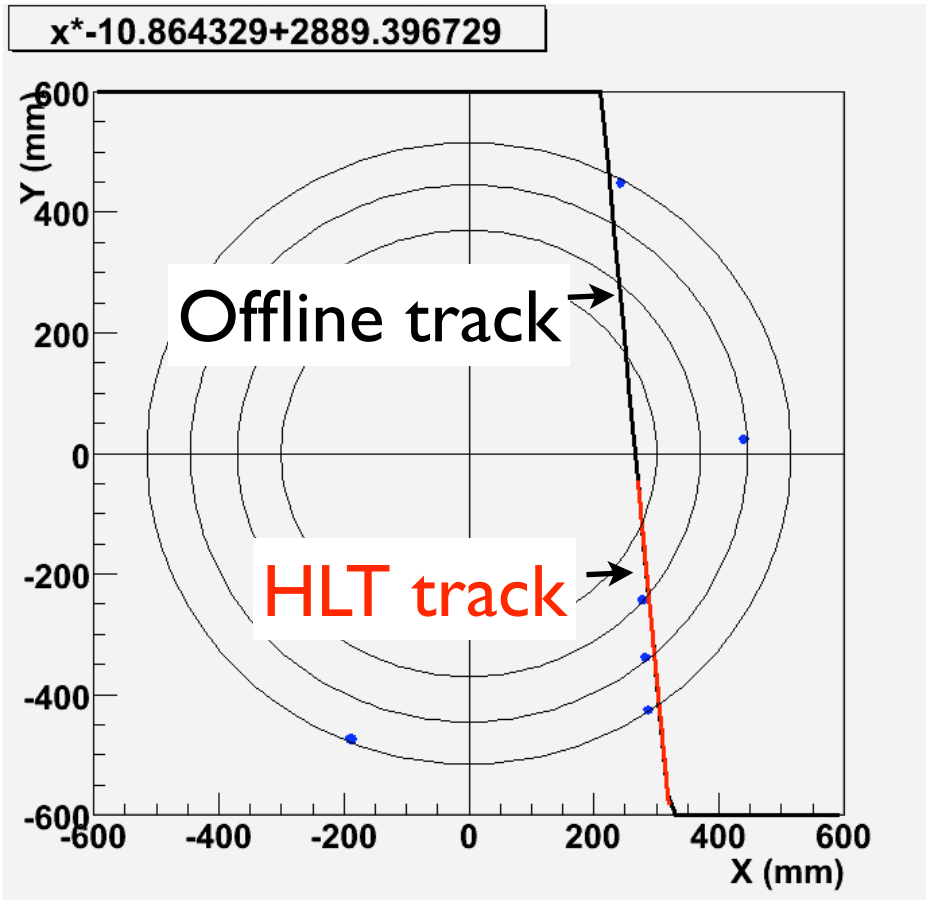
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FastSCT_RodDecoder ERROR Header: xxx Preamble Error
FastSCT_RodDecoder ERROR Header: xxx LVL1 ID Error
FastSCT_RodDecoder ERROR Header: xxx BCID Error
FastSCT_RodDecoder ERROR xxx Raw Data Mode 6000
FastSCT_RodDecoder ERROR xxx Raw Data Mode 6000
FastSCT_RodDecoder ERROR xxx Flagged ERROR
in chip 0 Error code ABCError 0 Link Nb (or Stream) 16
  
```

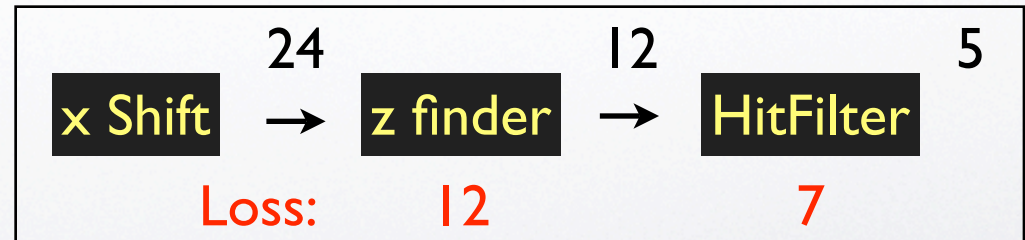


IDSCAN

Laura Maria Gonzalez Silva & Jamie Boyd



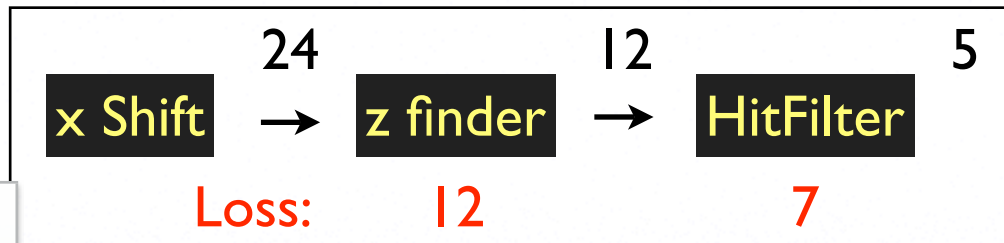
- Offline & HLT algo agree
- 1164 evts
- 24 with offline tracks
- 5 with IDSCAN tracks
- $24 - 5 = 12 + 7$



- Working on understanding ineff.:
 - Misalignment
 - Noise



IDSCAN: Missed Tracks



Event	HLT x Shift	Offline x Shift
43	2.93	204.52
84	0	0.41
149	91.6	32.82
191	221.31	225.34
331	0	329.54
337	125.15	110.16
338	125.15	260.37
371	129.02	307.19
496	170.95	123.95
771	273.69	235.65
822	28.76	29.09
914	325.98	330.52

Event	HLT x Shift	Offline x Shift	HLT z	Offl. z
65	186.53	237.68	-737	-556
274	296.53	296.62	365	434
429	232.93	232.92	-658	-669
488	295.66	233.72	666	589
608	73.34	73.36	608	635
696	14.04	26.47	515	512
948	227.27	227.33	434	397

Matches

Event	d0		phi0		z	
	HLT	Offl	HLT	Offl	HLT	Offl
105	264.6	264.8	-1.519	-1.520	-77	-65
294	45.2	44.9	-1.593	-1.592	-481	-460
763	47.0	46.8	1.541	1.60	564	530
773	1.3	2.2	-1.625	-1.627	684	583
783	44.5	44.4	-1.571	-1.571	285	282



SiTrack

Andrea Coccaro, Carlo Schiavi, Nicoletta Garelli, Fabrizio Parodi

- Offline: 51 TRT tracks / 25 with associated SCT hits
- SiTrack/CVS tuning (based on sim. cosmics and ideal detector): 6 events with tracks
- SiTrack/looser cuts (to take into account detector misalignment): 15 events with tracks
- No fakes: all SiTrack tracks have offline matches
- Some of the missing 10 offline tracks have a low number of SCT hits associated (see next slide)
- Not straightforward to spot intermittently noisy modules:
- A tighter, but more robust SiTrack tuning is currently being readied
 - slightly lower efficiency (preliminary result: 11 events with tracks)
 - no fake tracks even without modules masking

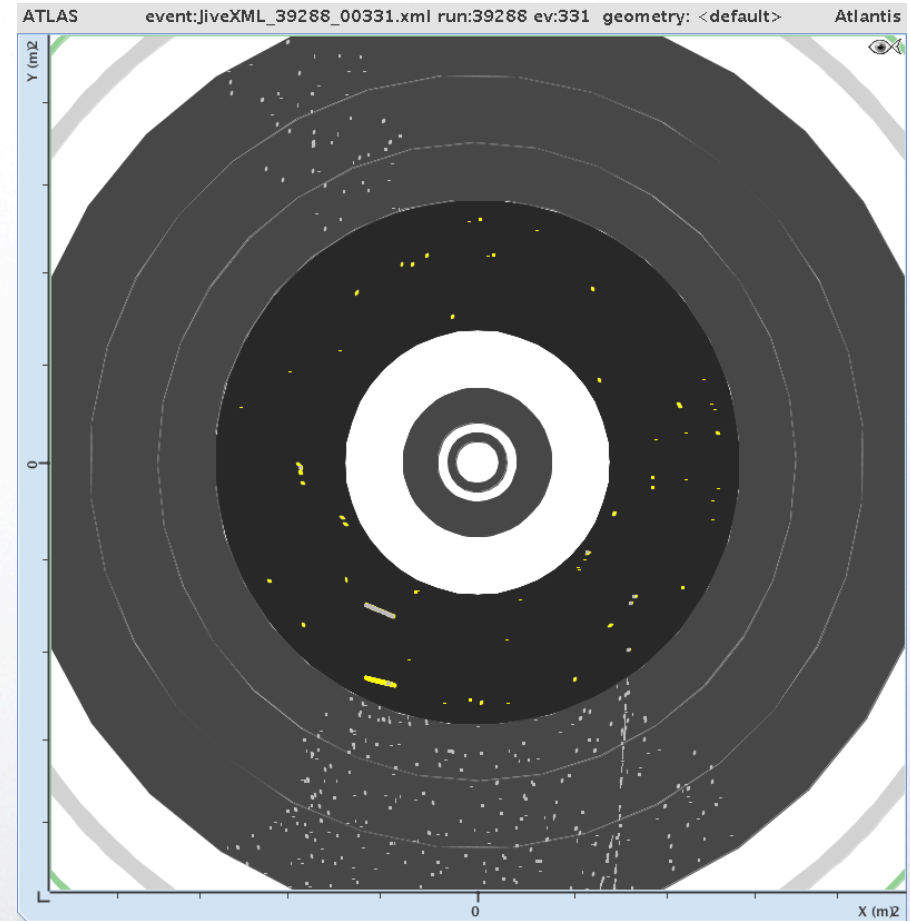
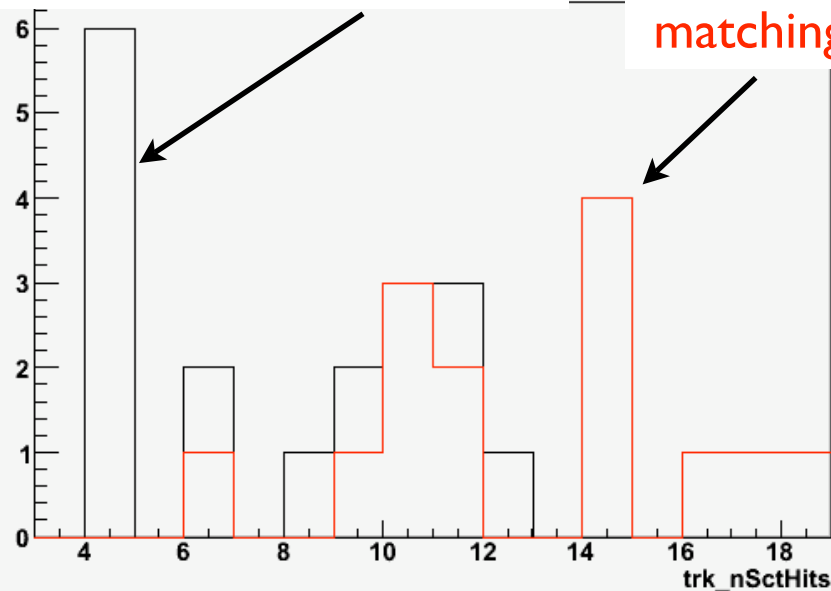


SiTrack: Missed Tracks

Andrea Coccaro, Carlo Schiavi, Nicoletta Garelli, Fabrizio Parodi

An example of an event with a very low number of SCT hits associated to the TRT track is shown in the event display; it seems very difficult to reconstruct these tracks using SCT data only

Black: offline TRT+SCT tracks Red: offline tracks matching SiTrack





M6



General Plan

- Fallback is dummy/empty slices (used and tested during P3 and before)
- Baseline: muon algorithms inherited from P3
- Incrementally add algorithms minimizing disturbance as time/opportunity rise



Follow detectors integration

	Monday AM	Monday PM	Tuesday AM	Tuesday PM	Wed AM	Wed PM	Thur AM	Thur PM
Muons	IN	IN	IN	IN	IN	IN	IN	IN
TRT			Turn On	IN	Off	Off	IN / Turn on (hours)	IN
SCT			Turn On	IN	Off	Off	IN / Turn on (30')	IN
Calo					Turn On	IN	IN	IN
HLT	P3 configuration	P3 configuration	P3 configuration	Tracking in Tracking + muon or muon overnight	Muons	Muons+Calo algos	Muon + Calo	Muon+calo +tracking



Contingencies

- Put in earlier if time allows
- Otherwise test & include new features thurs/fri:

	Thur/Fri	on the fly
combined ID tracking	x	late tues
MinBias	x	late(r) tues
TGC Muon Reco	x	late mon
Tile code 4 ROD fw	x	late wed
tau/jet/calor	x	late(r) wed
combined tile/ID	x	not before thur
calibration triggers type	x	late wed



Pending Issues

- athenaMT crash at end of job (patched)
- LI muon cabling map (requires new muFast tags) (work in progress)
- Tile algorithms memleaks (work in progress)
- Streaming strategy
- Patch & Test for LI Calo decoding