

2012 Data Fast Reprocessing

Arnaud Lucotte, Guillaume Unal, Jamie Boyd, Luca Fiorini,

Thanks to :

the usual dream team

James, Joao, David, Martina, Carl, Adrian, Sasha, Misha, Walter, Borut, Stephane, Gavin, Karsten, Sebastien, Graeme, Junji, Pavol, Claudio, Peter, Rod, Rolf, Tobias, etc...

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Fast reprocessing : Motivations

Motivation for reprocessing

The main improvements are summarized here:

<https://indico.cern.ch/conferenceDisplay.py?confId=205566>

Among the main motivations:

- Improved Conditions for all data
- Fix of many small problems affecting significant fractions of data (see next slides)
- Recover a few runs in the Good Run List
- Improve possibly by 1-2% the LAr DQ efficiency

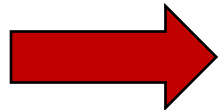
Boundary conditions

Among the main constraints:

- Condition update for data only, no software change : ***no need to reprocess MC !***
- All 2012 data AODs available before Christmas

Drives the reprocessing plans :

- Reprocess part of data (up to October) at Tier1 and ***then*** switch Conditions to Tier0
- In case of few runs have bad calibration loop updates at Tier0, recover at the end



Provide best 2012 data we can w/ rel 17
for winter conferences !

Motivation : more details (1)

Inner Detector

ID alignment

B-layer conditions problems for part of period A

TRT fix for the run in C8 which had the wrong dead straw list uploaded

LAr Calorimeter

FCAL HV calibration corrections [Improve 1.4/fb]

Problems with HV power supply system of FCAL channels for which HV readings were unreliable. Affects HV scale determination, resulting in $\sim 10\%$ energy shift in $1/4 \phi$ -region;

- Need correct HV reading which required new measurement of faulty modules
- Use corrected HV readings to recompute scale corrections
... applied at reconstruction levels (when building raw channels)

Cell-level OFC timing corrections

Cell-level timing corrections to be applied to the OFC-reconstructed time to improve LAr timing.

-- Gain of 1-2%.

LAr noise mask and event veto [recover 55/pb]

Apply proper noisy cell masking and noise burst vetos for a couple of runs in A4 and A8

Motivations : More details (2)

Muons

Calibrations

MDT calibration update for B1-B5 (correct a wrong flag in DB)

Calibration streams were off for some runs in period D

Alignment

- Barrel+Endcap alignment now includes EC alignment from I-lines (CSC internal alignment)
- Using new Muon Spectrometer layout, ie ATLAS-GEO-20-00-02

Tile Calorimeter

Fix for the hot cell affecting B1+B2

Timing for one run in B4.

AODFix

AODFix currently applied to the MC production :

- new e/γ isolation, reurun track isolation for μ , update of τ ID, τ - μ/e veto, τ -energy scale, MetRef bugFix

Applied those changes at the RECO level for data to save significant time in D3PD making

- Validated by comparing AODFix vs reconstruction

Data to be reprocessed

<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/Summer2012Reprocessing>

Period	SubPeriod	Nb of runs	Run Range
A	A1 to A8	29	200804 to 201556
B	B1 to B14	72	202660 to 205113
C	C1 to C9	34	206248 to 207397
D	D1 to D8	48	207447 to 209025
E	E1 to E6	29	209074 to 210308
G	G1 to G5	18	211522 to 212272

Data accumulated up to MD#3

About 1.8 billion events

→ ~2 that of 2011

CPU Timing : 25s/evt (pile-up)

→ Double that of 2011

AOD Size: 300kB/evt resulting in ~0.6 PB

ESD size too large : « life w/o ESDs »

- Number of events per AOD

Stream/Period	Period A	Period B	Period C	Period D	Period E	Period G	TOTAL
Egamma	43,266,159	177,569,377	51,382,952	113,173,567	86,690,531	43,857,431	515,940,017
Muons	43,661,420	163,597,791	80,935,368	112,743,072	81,667,914	41,182,058	523,787,623
JetTauEtmis	64,345,937	189,247,789	53,773,871	121,460,633	111,745,415	57,078,247	597,651,892
Background	--	19,921,757	5,257,730	14,675,969	10,433,550	6,571,508	56,860,568
MinBias	6,000,436	16,156,158	40,824,856	10,456,014	7,276,542	3,652,824	84,366,830
TOTAL AOD	157,273,952	566,492,872	232,174,777	372,509,255	297,813,952	152,342,068	1,778,606,930

Fast Reprocessing : first step of reprocessing

Express Stream reprocessing

First phase of reprocessing:

- reprocess express_express & cosmicCalo streams
- determine the beam spot & validate Conditions

Task	Tag	Status	Period A	Period B	Period C	Period D	Period E	Period G
Nb of Runs			29 runs	72 runs	34 runs	48 runs	29 runs	18 runs
Run [Min,Max]			200804 to 201556	202660 to 205113	206248 to 207397	207447 to 209025	209074 to 210308	211522 to 212272
ESD.AOD.HIST (r4011)	[r4011]	[STATUS]	[input list]	[input list]	[input list]	[input list]	[input list]	[input list]
HIST merging (p1244)	[p1244]	[STATUS]	[input list]	[input list]	[input list]	[input list]	[input list]	[input list]
HIST Supermerging (p1244_p1244)	[p1244]	[STATUS]	[input list]	[input list]	[input list]	[input list]	[input list]	[input list]

Express reprocessing Configuration

- Atlas release: 17.2.6.5
- Conditions tag : COMCOND-BLKPA-006-06
- DB release : 20.5.1
- Beam constraint : set to false

Output Dataset pattern

- rtag : r4011 (AOD, HIST)
- ptag: p1244_p1244 (merged HIST)

Status:

- 12-OCT : ES reprocessing launched
- 24-OCT : ...last runs reprocessed
- 25-OCT : Beam spot determined and
uploaded & linked to global tag
- 26-OCT : DQ signed off

Fast reprocessing : Bulk reprocessing

Bulk reprocessing

Phase II of the reprocessing :

- using the Beam spot & Conditions derived in ES
- using latest Conditions (Lar and Tile updates)

Streams reprocessed:

- all main physics streams, *then* delayed streams

Reprocessing order :

- Period D, B, (highest stat) then A, C, E and G
- **No ESD kept for main physics streams (keep only B11+D3)**

Bulk reprocessing outputs : “Life w/o ESD”

1) Reconstruction step (*r-tag*)

- AOD, HIST, TAG , DRAW
- DESD (stream-dependent):
 - [MinBias] DESD_MBIAS, DESD_SGLMU, DESDM_MET
 - [EGamma] DESD_EGAMMA, DESD_PHOJET, DESD_SGLEL, _RPVLL
 - [Muons] DESD_SGLMU, DESD_RPVLL
 - [JetTauEtMiss] DESD_CALJET, DESDM_TRACK, DESDM_MET, _RPVLL

2) Production of DAOD and DESD (*p-tag*)

- DAOD_ZLL, DESD_ZLL from DRAW

3) Merging of output formats (*p-tag*)

- AOD, HIST, TAG and DESDs will be merged

Bulk reprocessing

Physics streams:

- physics_CosmicMuons
- physics_CosmicCalo
- physics_Egamma
- physics_Muons
- physics_JetTauEtMiss
- physics_Background
- physics_MinBias
- physics_IDCosmic
- physics_ZeroBias
- express_express
- debug_hltacc
- physics_standby

+ Delayed streams:

- physics_jetCalibDelayed
- physics_HadDelayed
- physics_Bphysics

DRAW reprocessing

Physics streams:

- Muons and Egamma streams
- Required by RecoPerf

Fast reprocessing : Bulk reprocessing

Bulk reprocessing

Phase II of the reprocessing :

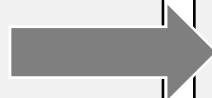
- using the Beam spot & Conditions derived in ES
- using latest Conditions (Lar and Tile updates)

Streams reprocessed:

- all main physics streams, *then* delayed streams

Reprocessing order :

- Period D, B, (highest stat) then A, C, E and G
- **No ESD kept for main physics streams (keep only B11+D3)**



Express reprocessing Configuration

Software and DB

- Atlas release: 17.2.7.3
- Conditions tag : COMCOND-BLKPA-006-07
- DB release : 20.7.1
- Beam constraint from ES reprocessing

Fixes in 17.2.7.3...

- Update of list of errors to ignore
- Still working on a fix to allow for handling of empty DRAW files (causing pbme when creating DESD_, DAOD-ZLL)

Bulk reprocessing

Physics streams:

- physics_CosmicMuons
- physics_CosmicCalo
- physics_Egamma
- physics_Muons
- physics_JetTauEtMiss
- physics_Background
- physics_MinBias
- physics_IDCosmic
- physics_ZeroBias
- express_express
- debug_hltacc
- physics_standby

+ Delayed streams:

- physics_jetCalibDelayed
- physics_HadDelayed
- physics_Bphysics

2012 reprocessing :status and plans

MON-17-SEP	Build base release for reprocessing	completed
Week of 24-SEP	Validation and Cache release build	completed
MON-08-OCT	Freeze list of runs to be reprocessed	completed
FRI-12-OCT	Lock Conditions Tag for express stream; setup DBRelease; launch slice-test	completed
SAT-13-OCT	Validate slice-test	completed
MON-15-OCT	Launch express stream	Completed
WED-22-OCT	Beam spot determination. New Data Conditions to be used for bulk reprocessing	done
FRI-26-OCT	DQ signing Off.	completed
MON-29-OCT	Setup cache release 17.2.7.3 with latest bugFix	reported from FRI-26-OCT
WED-31-OCT	Lock Conditions Tag. Setup DBRelease	reported from FRI-26-OCT
WED-31-OCT	Launch of slice-test reprocessing	To be done
THU-01-NOV	Launch of Bulk reprocessing	To be done
WED-28-NOV	End of Bulk reprocessing (?)	To be done
FRI-07-DEC	DQ Signing Off (?)	To be done

2012 reprocessing : summary

Reprocessing status

Tier0 data now processed with same new Conditions since period H

Tier1 reprocessing progressing well:

Phase 1: Express stream reprocessing completed on time !

New Conditions and Beam spot determined

Phase 2: Bulk reprocessing to be started this week:

Presently delayed by Tile update (deadline on WED-31-OCT)

Presently delayed by DRAW handling pbme

Reprocessed data will have a new GRL tag v14 compatible with data taken from period H

→ **Plan to sign off repro data period/period so that D3PD production can start sooner, and allow performance studies to take place with periods B and D soon in November**

More details about data reprocessing

Reprocessing page for 2012:

<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/Summer2012Reprocessing>

More details about MC reprocessing

<https://twiki.cern.ch/twiki/bin/viewauth/AtlasProtected/DataMCForAnalysis>

Fast reprocessing : COMCOND-BLKPA-006-07

New Conditions for BULK reprocessing

Any updates with respect to [COMCOND-BLKPA-006-06](#) should only be for pre-MD3 IoVs

- ☒ INDET: New beamspot derived from ES1 reprocessing (Martina Hurwitz, Carl Gwilliam)
 - /Indet/Beampos : IndetBeampos-ES1-UPD2-05
- ☒ SCT Updates update to noisy strip map and missing endcap updates (Junji Tojo)
 - /SCT/Derived/Monitoring : SctDerivedMonitoring-UPD4-003
- ☒ LAR: Update of bad channels (Walter Lampl)
 - /LAR/BadChannelsOfI/EventVeto : LARBadChannelsOfIEventVeto-UPD4-04
 - /LAR/BadChannelsOfI/BadChannels : LARBadChannelsOfIBadChannels-UPD4-10
- ☒ LAR: Fix of sign used in corrections (Pavol Strizenec)
 - /LAR/TimeCorrectionOfI/CellTimeOffset : LARTimeCorrectionOfICellTimeOffset-UPD4-01
- ☐ TILE: Completion of timing improvements, folder /TILE/OFL02/TIME/CHANNELOFFSET/PHY (Carlos Solans, Claudio Santoni, Andrei Artamonov)
- ☐ TILE: New Cesium constants: zero HV reference for EBA34, folder /TILE/OFL02/CALIB/CES (Carlos Solans, Claudio Santoni, Andrei Artamonov)
- ☐ TILE: Fix to response variation of laser for runs 210531-212272 (period G) (Carlos Solans, Claudio Santoni, Andrei Artamonov)

More details about data reprocessing

Reprocessing page for 2012:

<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/Summer2012Reprocessing>

Software Deliverables:

<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/FastReprocessingSoftwareUpdates>

Data Conditions :

<https://twiki.cern.ch/twiki/bin/viewauth/Atlas/ConditionsUpdates2012Reprocessing>