information about

Tools for Finding Datasets: Run Query, COMA, AMI

23 Oct 2019

Software Tutorial at CERN

Based on slides from Louise Heelan, Elizabeth Gallas (for COMA)
and the AMI-team

Before you do an analysis...
... you need to know *what* to analyze

- huge amounts of data, represented in huge variety of formats (RAW, EVNT, ESD, xAOD, DxAOD, NTUP, etc.)

- real data:
  - multiple streams and triggers
  - multiple versions for express reconstruction, bulk reconstruction, re-reconstruction
  - grouped in luminosity blocks (1-2 mins), runs (mins-hours), periods (days or weeks), containers (variable), years, center of mass energy, etc.

- Monte Carlo (MC):
  - steps: generation, simulation, digitization, reconstruction & associated software
  - fast vs full simulation
  - geometry, conditions, generator configurations
  - cross-sections, k-factors, filter-efficiencies

There are tools to help you find data and MC, & understand their configurations

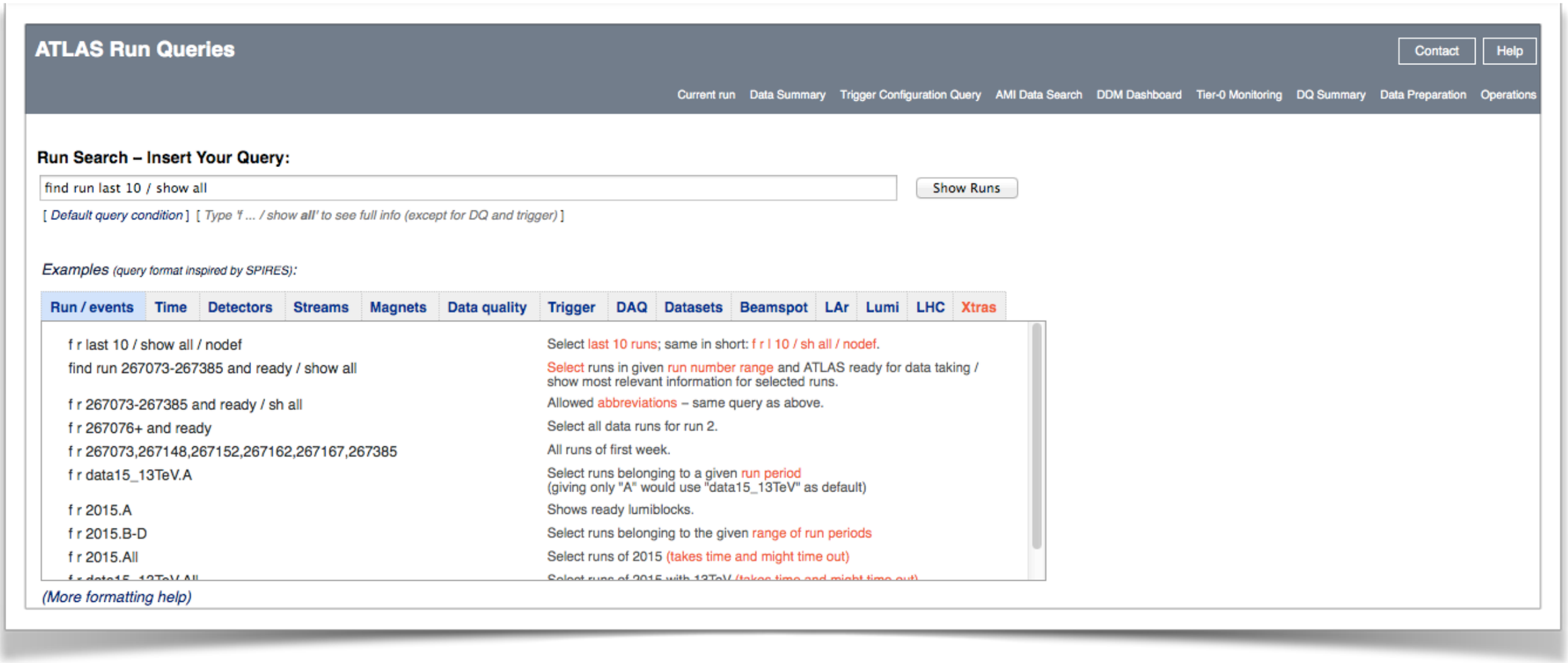
Overview: Tools for finding datasets

Run Query	Detailed information about data at *run-level* (and lumi-blocks within) https://atlas-runquery.cern.ch/
COMA	Conditions & configuration information about data in *containers/periods/runs/ lumi-blocks* https://atlas-tagservices.cern.ch/tagservices/RunBrowser/index.html/
AMI	Catalogue framework for data and MC datasets (and TAG nomenclature) https://ami.in2p3.fr//

*These tools can do many, many things, beyond what is shown in this limited talk.
Here we will show the typical use cases for each of these tools

Run Query:
Everything you need to know about data runs

https://atlas-runquery.cern.ch/



The Run Query web interface

query field

detailed links

eries

Contact | Help

Current run | Data Summary | Trigger Configuration Query | AMI Data Search | DDM Dashboard | Tier-0 Monitoring | DQ Summary | Data Preparation | Operations

Run Search – Insert Your Query:

find run last 10 / show all

→default text

Show Runs

[*Default query condition*] [*Type 'f ... / show **all**' to see full info (except for DQ and trigger)*]

Examples (query format inspired by SPIRES):

Run / events	Time	Detectors	Streams	Magnets	Data quality	Trigger	DAQ	Datasets	Beamspot	LAr	Lumi	LHC	Xtras

f r last 10 / show all / nodef	Select last 10 runs; same in short: f r l 10 / sh all / nodef.
find run 267073-267385 and ready / show all	Select runs in given run number range and ATLAS ready for data taking / show most relevant information for selected runs.
f r 267073-267385 and ready / sh all	Allowed abbreviations – same query as above.
f r 267076+ and ready	Select all data runs for run 2.
f r 267073,267148,267152,267162,267167,267385	All runs of first week.
f r data15_13TeV.A	Select runs belonging to a given run period (giving only "A" would use "data15_13TeV" as default)
f r 2015.A	Shows ready lumiblocks.
f r 2015.B-D	Select runs belonging to the given range of run periods
f r 2015.All	Select runs of 2015 (takes time and might time out)
f r data15_13TeV.All	Select runs of 2015 with 13TeV (takes time and might time out)

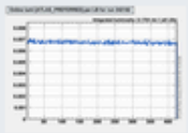
Examples (long / short)

(More formatting help)

Sending a web query (the default)

Search Result

Selection rule: find run last 10 / show all
Query command: [Click to expand/collapse command...]
AtlRunQuery.py --run last10 --dqsumgrl "PHYS_StandardGRL_All_Good_25ns" --logictag "HEAD" --defecttag "HEAD" --partition "ATLAS" --projecttag "data0*,data1*" --show run --show events --sho
time --show readyforphysics --show lhc --show trigkeys --show release --show streams --show detmask --show olclumi --show olclbdata --show olcfillparams --verbose
Selection sequence: Checking for runs in 342013-1073741824
Checking if the filename tag matches "data0*,data1*"
Checking if partition name matches "ATLAS"
Selecting the 10 most recent runs
No. of runs selected: 7
Total no. of events: 32,862,338
Execution time: 28.0 sec

						LHC and online luminosity information					Trigger infor	
Run	Links	#LB	Start and endtime (local)	#Events	Ready for physics	LHC Fill	Stable beams	Beam energy and intensities	Online del. Luminosity [ATLAS_PREFERRED]	Bunch structure	SMK	HLT Release
342182 Period: O1,O AllYear	DS, RS, BS, AMI, DQ, ELOG, DCS:SoR/EoR, OKS	424 (60 s)	Mon Dec 04 2017 04:45:40 – 11:49:57	3,906,870 (153.5 Hz)	0	6467	FALSE	 Maximum intensities: Beam 1: 0 e11 protons Beam 2: 0 e11 protons Maximum beam energy: 59 GeV [*Numbers given for stable beam period (if applies)*]	 All LBs: 0.1704	*Run without stable beams (or, in few cases, missing bunch information in COOL). Click here to obtain bunch crossing information.*	2635 Physics_pp_v7 (v.127) Cosmics, ATR-17358	21.1.19

rmation			Data stream statistics								
	Prescale keys	Bunch group key	physics_ Background	physics_ CosmicCalo	physics_ CosmicMuons	physics_ L1Topo	express_ express	calibration_ CostMonitoring	calibration_ MuonAll	calibration_ PixelNoise	Detector systems
9	LB range L1 HLT 1 – 424: 17828 | 13237 | *Prescale evolution...*	LB range BGS 1 – 424: 1397	9,677 (max: 0.67 Hz, ave: 0.39 Hz, 0.2%,, 197.8 MB/run, 20.9 kB/evt)	26,748 (max: 1.51 Hz, ave: 1.06 Hz, 0.6%,, 436.2 MB/run, 16.7 kB/evt)	3,855,623 (max: 164.53 Hz, ave: 153.44 Hz, 91.5%,, 76.6 GB/run, 20.8 kB/evt)	106,152 (max: 5.12 Hz, ave: 4.22 Hz, 2.5%,, 2.5 GB/run, 24.3 kB/evt)	213,427 (max: 9.73 Hz, ave: 8.49 Hz, 5.1%,, 4.2 GB/run, 20.8 kB/evt)	60,920 (3.4 GB/run, 57.8 kB/evt)	3,814,509 (2.0 GB/run, 574 B/evt)	246,601 (426.1 MB/run, 1.8 kB/evt)	**Detector mask = 45643674419200 (0x29833f000000), corresponding t systems:** MDT BA, MDT BC, MDT EA, MDT EC RPC BC, CSC EA, CSC EC, MUCTP HLT [SCT HV setting]

+more runs

The command line

- setup: pyami (more later), valid voms proxy, Athena release

```
> setupATLAS
>lsetup pyami 'asetup Athena,21.0.102'
> voms-proxy-init -voms atlas
```

- sample commands:

```
> AtlRunQuery.py --help
> AtlRunQuery.py ‘f r 2018.G-H/sh all’
```

COMA:

Quick access to basic run information and aggregation of information across many runs

https://atlas-tagservices.cern.ch/tagservices/RunBrowser/index.html/

COMA Portal

Interface (link)	Purpose
COMA Period Menu	**Data Period Documentation Menu** ... generates COMA Data Period Reports which describe the selected Data Period(s) and contains hyperlinks to COMA and other Run reports.
COMA Report Menu	Conditions Metadata Report Menu ... generates **COMA Run**, **RunTrigger**, **RunStream**, **MasterKey**, **Chain**, **Level 1 Item**, and **Prescale** Reports: Displaying general properties, COMA derived properties, and related hyperlinks for the entities matching the input criteria.
COMA GRL Metadata Browser	This interface combines metadata collected about Good Run List XML files with other metadata in COMA for browsing for GRL files. Buttons generate **COMA GRL Metadata Reports** with links to the Official GRLs and show related Stream and Trigger metadata.
COMA COOL Folder & Tag Browser	Browse Conditions database (COOL) Folder and Tag metadata in COMA to find folders, folder and global tags, and display their properties. Create customized Global Tag reports.

Event Metadata

Interface (link)	Purpose
EventIndexOracle Dataset Browser	**Event Metadata Browser/Report** for Event-level metadata services based on **Oracle storage** of Event Metadata from EventIndex. Users should feel free to test and compare the Oracle-based system with the EventIndex **Hadoop** based system described in TWiki: *EventIndex*.

Send feedback to *ATLAS Metadata Feedback*

Click HERE to SHOW OLDer COMA Interfaces:

COMA Portal ***TWiki: Conditions Metadata*** ***Problems / Questions?***

COMA portal overview

popular for physics users

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conditions DB experts

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Click HERE to SHOW OLDer COM

event-level metadata

COMA Portal ***TWiki: Conditions Metadata*** ***Problems / Questions?***

COMA period menu

COMA Portal

Interface (link)	Purpose
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Data period:

- set of runs grouped together for some purpose (often grouping 'like' detector or machine conditions)
- uniquely defined by project name (ex. data17_13TeV) AND period name (ex. 'C' or 'C2')

by Year:	*all years* *2017* *2016* *2015* *2014* *2013* *2012* *2011* *2010* *2009*
by Project:	*data17_hi* *data17_cos* *data17_900GeV* *data17_5TeV* *data17_13TeV* *data16_hip8TeV* *data16_hip5TeV* *data16_cos* *data16_comm* *data16_13TeV* *data15_hi* *data15_cos* *data15_comm* *data15_5TeV* *data15_1beam* *data15_13TeV* *data14_cos* *data13_hip* *data13_2p76TeV* *data12_hip* *data12_cos* *data12_8TeV* *data11_hi* *data11_7TeV* *data11_2p76TeV* *data10_hi* *data10_900GeV* *data10_7TeV* *data09_900GeV* *data09_2TeV*
by Energy or Type:	*5TeV* *13TeV* *hip8TeV* *hip5TeV* *2p76TeV* *8TeV* *7TeV* *2TeV* *900GeV* *hi* *hip* *cos* *comm* *1beam*
by Period:	*-/+ data17_hi* *-/+ data17_cos* *-/+ data17_900GeV* *-/+ data17_5TeV* *-/+ data17_13TeV*

Example period report

Period	Stat	Links: Runs, Containers	Description	Date Range	Run Range	#	StableLum (pb^{-1})	Ready Lum	MaxInstLum ($10^{30}cm^{-2}s^{-1}$)	μ Max (Avg)	Fills	Bunch Count	Bunch dt (ns)	Machine Mode BeamE	Solenoid	Toroid
data17_13TeV **AllYear** [A:N]	🔒	ComaRun; ComaPStream; ComaPTrig; runQuery	Physics pp collisions at 13 TeV during 2017.	17-May-23: 17-Nov-26	324320: 341649	226	50604	49721 (98.3%)	20614	78.6	5697: 6417	1 : 2544	25 : 44625	Proton 6499 - 6500	Off Ramp On	Off Ramp On
A [A1:A4]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Data taking during ramp up after EYETS in 2017.	17-May-23: 17-Jun-03	324320: 325558	14	142	135 (95.2%)	1820	42.7	5697: 5737	2 : 336	25 : 44625	Proton 6499 - 6500	Off Ramp On	Off Ramp On
B [B1:B8]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Data taking with the HLT switched on, during the LHC ramp up.	17-Jun-04: 17-Jun-30	325713: 328393	34	6242	6099 (97.7%)	15815	51.2	5746: 5887	9 : 2544	25 : 7125	Proton 6499 - 6500	Ramp On	On
C [C1:C8]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Data taken after TS1 and MD1, starting on July 8.	17-Jul-09: 17-Jul-24	329385: 330470	20	2850	2775 (97.3%)	16776	46.9	5916: 5985	1 : 2544	25 : 50	Proton 6499	On	On
D [D1:D6]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Runs after MD2 on July 27.	17-Jul-27: 17-Aug-10	330857: 332304	27	6423	6323 (98.4%)	17466	48.8	6010: 6062	25 : 2544	25 : 1000	Proton 6499	On	Off Ramp On
E [E1:E8]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Runs after the switch of the online release to 21.1.10	17-Aug-11: 17-Sep-04	332720: 334779	37	5262	5157 (98%)	14059	45.6	6072: 6165	589 : 2208	25	Proton 6499	On	On

Yellow links: show/hide members

Blue links: click for detailed description

Example period runs report

Period	Stat	Links: Runs, Containers	Description	Date Range	Run Range	#	StableLum (pb^{-1})	Ready Lum	MaxInstLum ($10^{30}cm^{-2}s^{-1}$)	μ Max (Avg)	Fills	Bunch Count	Bunch dt (ns)	Machine Mode BeamE	Solenoid	Toroid
data17_13TeV **AllYear** [A:N]	🔒	ComaRun; ComaPStream; ComaPTrig; runQuery	Physics pp collisions at 13 TeV during 2017.	17-May-23: 17-Nov-26	324320: 341649	226	50604	49721 (98.3%)	20614	78.6	5697: 6417	1 : 2544	25 : 44625	Proton 6499 - 6500	Off Ramp On	Off Ramp On
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COMA Period Runs Report

Project Name (fnt) : data17_13TeV

Period Name (pn) : C

+ Data Periods (1):

Related COMA Period Links:

- Period Stream Report (active streams during all Runs in this Period)
- Period Trigger Report (prescale active triggers w/Lumi in this Period)

Found 20 Runs matching the input criteria with Total Stable (Ready) Lum of 2850279 (2774604) nb^{-1}.

+ Customize the Multi-Run Report Table:

Project Run	Run Links	StartTime Events	Duration NLBN	SMK	Fills	Solenoid	Toroid	Period	ATLAS Ready Fraction	Stable Beams Fills	Bunch Count	Bunch dt	StableLum (nb^{-1}) (Ready)	InstLum Range ($10^{30}cm^{-2}s^{-1}$)	μ Range	Mac Mo Bea
data17_13TeV 330470	Run; RunTrig; RunStream; EIO; RQ; LumiDS	17-Jul-23 22:55 37178543	20265 s 5:37:45 LBs:365	2581	5983 : 5985	On	On	AllYear, C, C8	**0.9**	**5984**	2544	25 ns	**112236 (100918)**	14067 - 16776	39.3 - 46.9	Proton 6499_
data17_13TeV 330328	Run; RunTrig; RunStream; EIO; RQ; LumiDS	17-Jul-22 09:59 110036341	30417 s 8:26:57 LBs:536	"	5980	On	On	AllYear, C, C7	**0.98**	**5980**	1272	50 ns	**141722 (139263)**	4903 - 7213	27.4 - 40.3	Proton 6499_
data17_13TeV 330294	Run; RunTrig; RunStream; EIO; RQ; LumiDS	17-Jul-21 16:23 187056481	58105 s 16:08:25 LBs:1011	"	5979	On	On	AllYear, C, C6	**0.98**	**5979**	2544	25 ns	**483858 (476124)**	6390 - 14993	17.9 - 41.9	Proton 6499_

Example period stream report

Period	Stat	Links: Runs, Containers	Description	Date Range	Run Range	#	StableLum (pb^{-1})	Ready Lum	MaxInstLum ($10^{30}cm^{-2}s^{-1}$)	μ Max (Avg)	Fills	Bunch Count	Bunch dt (ns)	Machine Mode BeamE	Solenoid	Toroid
data17_13TeV **AllYear** [A:N]	🔒	ComaRun; ComaPStream; ComaPTrig; runQuery	Physics pp 2017.												Off	Off
A [A1:A4]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Data ta EYETS													
B [B1:B8]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Data on, dur													
C [C1:C8]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Data ta starting													
D [D1:D6]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Runs af													
E [E1:E8]	❄	ComaRun; ComaPStream; ComaPTrig; runQuery; Containers	Runs af release													

COMA Period Stream Report

Project Name (fnt) : data17_13TeV
Stream Name (stm) : *
Period Name (pn) : C

You have not made any stream selection ...
Click here to select any of the following stream types: physics, express, debug*, calibration

- Active_Projects:

You have selected active runs in the following Project:

Project	Active Period Range	Active Run Range	# Runs	Date Range	Total RAW Events	Total SFO Event
data17_13TeV	C1 - C8	329385: 330470	20	2017-Jul-09: 2017-Jul-24	2,977,216,062	3,635,144,214

- Active_Streams(36):

! Hint ! Click your stream of interest to get Run-wise results.
The first 2 event counts shown are RAW (from AMI) and SFO (from online "SubFarmOutput") formats.
RAW events will be **yellow** when RAW counts < recorded counts (missing events),
and **orange** when RAW counts > recorded (duplicate events: AMI or processing error,
or cross stream data movement: events added from the debug stream (Run 218024)).
See the Run-wise results to identify the Runs in which this occurs.
EventIndex event counts are compared to RAW (gradient color scheme indicates completeness).
EI TrigStat event counts are compared to EI counts (gradient color scheme indicates completeness).

Stream	RAW Events	SFO Events	SFO Total Volume	SFO Event Volume	Active Period Range	Active Run Range
calibration_ABBAdata	1,954,108	2,107,971	24 GB	11.9 kB	C1 - C8	329385: 330470
calibration_AFP	3,971,773	3,971,773	5.5 GB	1.5 kB	C6 - C8	330294: 330470
calibration_BeamSpot	20,461,220	20,461,220	3.5 TB	181.7 kB	C1 - C8	329385: 330470
calibration_CostMonitoring	110,111,027	110,111,027	9.1 TB	88.7 kB	C1 - C8	329385: 330470

Example period trigger report

Period	Stat	Links: Runs, Containers	Description	Date Range	Run Range	#	StableLum (pb^{-1})	Ready Lum	MaxInstLum ($10^{30}cm^{-2}s^{-1}$)	μ Max (Avg)	Fills	Bunch Count	Bunch dt (ns)	Machine Mode BeamE	Solenoid	Toroid
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COMA Period Trigger Report

Project Name (fnt) : data17_13TeV
Trigger Chain Name (cn) : *
Period Name (pn) : C

A total of **1581** distinct Trigger Signature/Stream combinations (in **31** streams) were found to be active via prescale during all Stable Beam criteria. Their cumulative total SBR integrated and prescale corrected luminosities and related information is shown below grouped by Stream

The table here shows a summary of the count of the SBR active triggers by stream.
Use links here to jump down this page to the triggers in your stream of interest

New !! Event counts per trigger are shown on the COMA Prescale Reports. The **trigger chain links** below will lead directly to the Prescale R and/or Period. These counts are not aggregated here to avoid showing incompletely collected counts (missing counts in COMA due to various stream links in the section below lead to the associated COMA Temporal Stream Report which gives a summary of counts and missing associa

Stream Type	Stream Name	Trigger Count
physics	AFP	17
"	Background	6
"	BphysLS	55
"	CosmicCalo	12
"	HLT_IDCosmic	2
"	L1Calo	11
"	L1Topo	76
"	Late	21
"	Main	1027
"	MinBias	208
"	Mistimed	5
"	TauOverlay	2
"	ZeroBias	2

Stream Type	Stream Name	Trigger Count
monitoring	CSC	1
"	IDMonitoring	3

Stream Type	Stream Name	Trigger Count
express	express	82

+ detailed individual trigger information (ex. # events triggered in period, prescale range)

Back to the COMA portal...

When doing a physics analysis you will use one or several triggers. It is usually preferred to use an unprescaled trigger. How do you know if your trigger choice has been unprescaled over your entire data range?

Use the COMA Report Menu!

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Send feedback to *ATLAS Metadata Feedback*

Click HERE to SHOW OLDer COMA Interfaces:

COMA Portal ***TWiki: Conditions Metadata*** ***Problems / Questions?***

COMA Report Menu

COMA Report Input Menu

COMA Genereral Report Input Menu Instructions:

Enter one/more criteria, then <return> (or click SUBMIT) to generate a COMA Run, Stream, Trigger, MasterKey, Chain/Item or Prescale Report.

The Data Period Documentation Menu is located here: *COMA Period Documentation Menu*

Temporal (Run) related inputs

Project	Project Name (AKA FilenameTag or T0ProjectTag). Examples: *data17**(all 2017), *data17_13TeV*(one project), *data*_hi**(all Heavy Ion).
Period	Data Period Name or a list/range of Period Names. EG: *VdM** (all Van der Meer), *D1-D3,D5* (list/range), *** (all periods).
Run	One or more (list/range) of Run Numbers. Examples: *latest16* (latest 16 runs), *206365-206369,206444*(list/range), *206367* or *206573*(single runs).
GRL XML filename	data16_13TeV.periodAllYear_DetStatus-v88-pro20-21_DQDefects-00-02-04_PHYS_StandardGRL_All_G… GRL (Good Run List) XML file name. For example: *data16_13TeV.periodAllYear_DetStatus-v88-pro20-21_DQDefects-00-02-04_PHYS_StandardGRL_All_Good.xml* Find available GRL XML filenames using the *COMA GRL Metadata Browser*

Trigger/Stream related inputs

Master Key	Trigger Super Master Key input (with other criteria: becomes temporal criteria). Examples: *1428* (SMK Report), *1428-1430* (list/range).
Chain / Item	HLT_2e15_lhvloose_nod0_L12EM13VH HLT Chain Name or Level 1 Item Name. Examples: *HLT_2e15_lhvloose_nod0_L12EM13VH*, *EF_tau115_medium1*, *L2_J7*, *L1_j75**, *HLT_*tau** or *EF_*mu*JPSI* (wildcards). Lone Wildcard * (applies to Run Trigger or Project Trigger Reports),
Stream Type	Stream Type. Note: Calibration stream event counts are not collected in COMA. Examples: *physics* (explicit type), *debug** (wildcard), *express,physics* (list).
Stream Name	Stream Name (sometimes ignored). Examples: * (lone wildcard = all streams), *MinBias* (explicit name), *MinBias,ZeroBias* (2 streams), **bias** (wildcard)

SUBMIT !

Clear form !

- which inputs you fill in determines which report is generated
- in this example COMA report will reflect the run ranges in the GRL
- interested in one trigger (HLT_2e15_lhvloose_nod0_L12EM13VH)

COMA Report Menu

COMA Report Input Menu

COMA Genereral Report Input Menu Instructions:

Enter on
a COMA

The Data Perio

- ***Distinct Triggers (1, with Lumi 1):***

This section summarizes all trigger signatures containing level names matching input criteria.
Found: 1 distinct Trigger names with the input criteria;
1 of those triggers were enabled via prescale during Stable Beam Runs while the detector was in the Ready State.

The table below shows Run-wise Stable Beams Ready luminosity and associated prescale ranges and flags.
It does not correct for the losses due to rejected LBs of the GRL (which is only shown at the Run-level).
Open the "Run/Trigger" section below to find the Run-wise "HLTps" links for more details.

Trigger_Names	Ready *PSCorr StableLum* (nb^{-1})	SBReady *MIN_PS*	SBReady *MAX_PS*	Run Range (SBReady)	# Runs (SBReady)	Date Range (SBReady)	*PS FLAG* (SBR)	*PT FLAG* (SBR)	*RR FLAG* (SBR)
HLT_2e15_lhvloose_nod0_L12EM13VH L1_2EM13VH	**12,383,715**	1	10	297447:303892	67	16Apr26:16Jul15	0	-1	-1

Project	
Period	
Run	
GRL XML filename	
Master Key	Trigger Super Master Key input (with other criteria: becomes temporal criteria). Examples: *1428* (SMK Report), *1428-1430* (list/range).
Chain / Item	HLT_2e15_lhvloose_nod0_L12EM13VH HLT Chain Name or Level 1 Item Name. Examples: *HLT_2e15_lhvloose_nod0_L12EM13VH*, *EF_tau115_medium1*, *L2_J7*, *L1_j75**, *HLT_*tau** or *EF_*mu*JPSI* (wildcards). Lone Wildcard * (applies to Run Trigger or Project Trigger Reports),
Stream Type	Stream Type. Note: Calibration stream event counts are not collected in COMA. Examples: *physics* (explicit type), *debug** (wildcard), *express,physics* (list).
Stream Name	Stream Name (sometimes ignored). Examples: * (lone wildcard = all streams), *MinBias* (explicit name), *MinBias,ZeroBias* (2 streams), **bias** (wildcard)

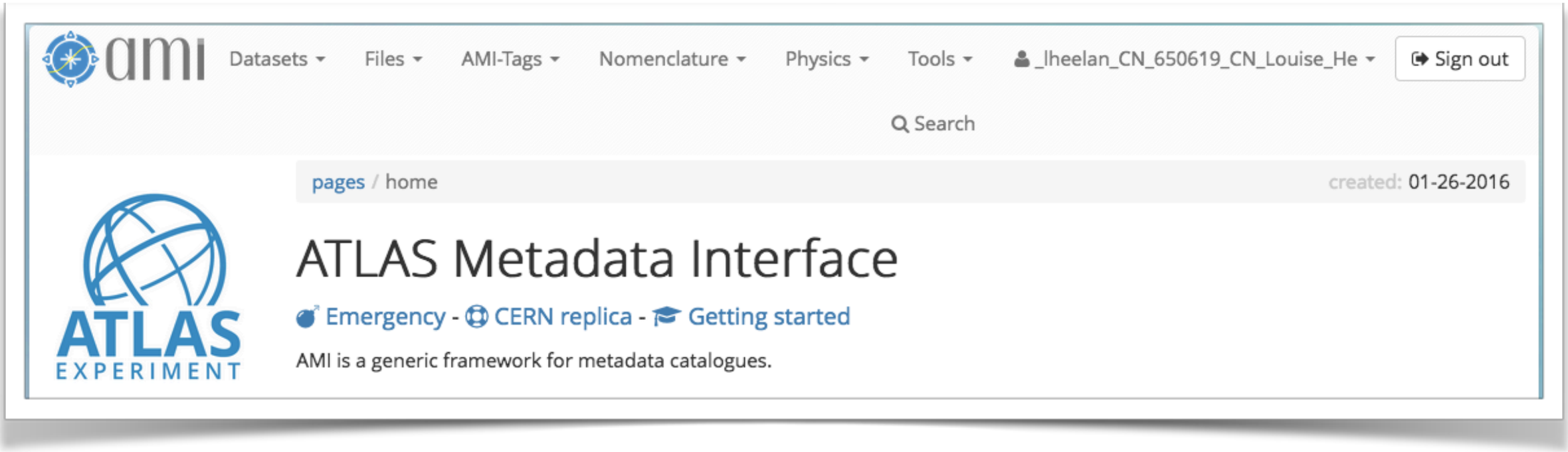
SUBMIT !

Clear form !

+ detailed information about that trigger in each run within the report run range (ex. can see which runs this trigger was prescaled)

AMI:
Metadata for data and Monte Carlo

https://ami.in2p3.fr//



AMI dataset discovery

- means finding the names of valid datasets to use in your analysis

- AMI contains lots of information linked to datasets:
  - dataset provenance, dataset size
  - file and event counts
  - software configuration tags ("AMI tags")
  - MC parameters (x-secs, generator, ...)
  - lost files and luminosity blocks
  - links to other tools: COMA, Rucio, ...

ATLAS datasets

Data	[scope:]Project.runNumber.streamType.productionStep.dataType.amiTag *(data17_13TeV.00339849.physics_Main.deriv.DAOD_TOPQ4.f889_m1902_p3402)*
MC	[scope:]Project.datasetNumber.physicsShort.productionStep.dataType.amiTag *(mc16_13TeV.424006.ParticleGun_single_mu_Pt5.merge.AOD.e3580_s3126_r9364_r9315)*

Legend

scope: used for Rucio catalogue

Project: dataxx_yyTeV or mcxx_yyTeV

amiTag: software config tags → https://ami.in2p3.fr/app/?subapp=tagsShow

Finding Datasets in AMI

Web applications

Main applications provided by AMI:

- **Dataset Browser**: search for real and simulated data.
- **AMI-Tags**: browse, view, compare and add ATLAS AMI-Tags.

Dataset Browser with AMI V1 | Dataset Browser with AMI V2 | AMI-Tags

Search Form

View Selection Selected datasets:25

Real Data | physics container

Valid datasets

projectName
Period
streamName
prodStep
dataType
AMITag
logicalDatasetName

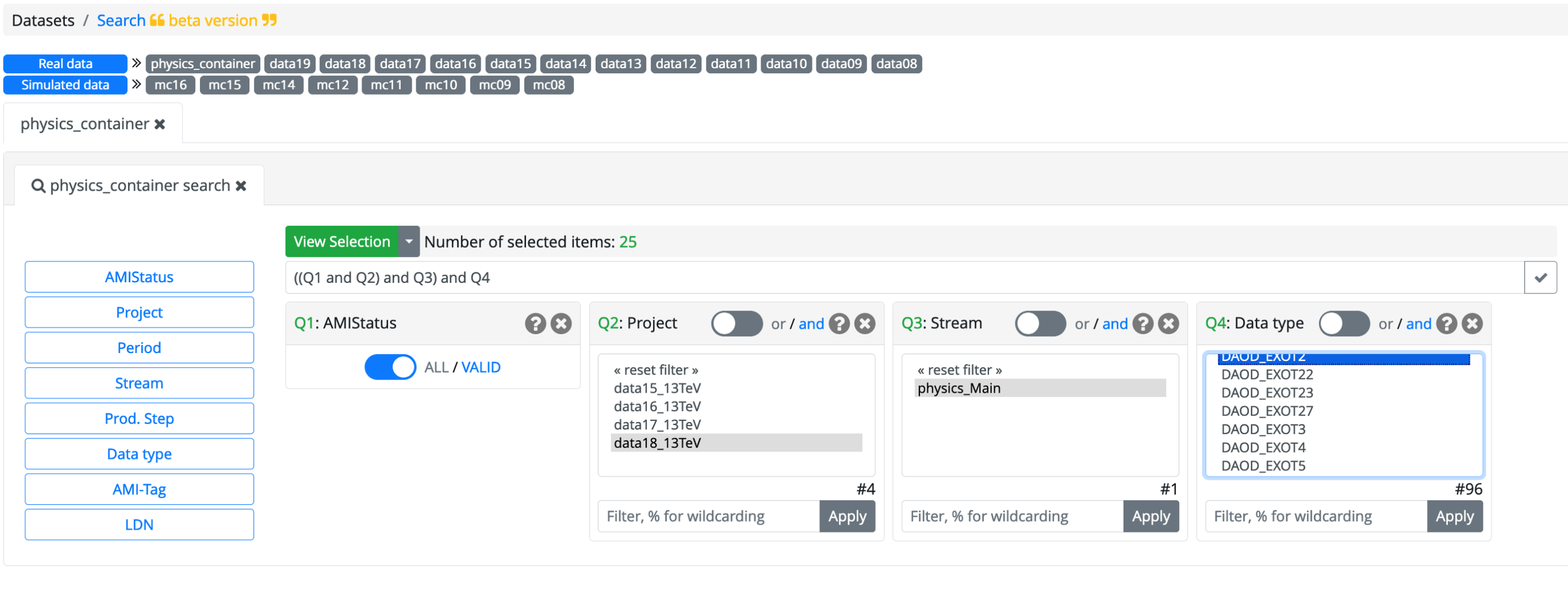
projectName: Any, data18_13TeV — Select

streamName: Any, physics_Main — Select

dataType: DAOD_EXOT12, DAOD_EXOT15, DAOD_EXOT17, DAOD_EXOT19, DAOD_EXOT2, DAOD_EXOT22, DAOD_EXOT23, DAOD_EXOT27 — Select

AMI (V2)

- V2 version also now available (in *Beta*)



AMI web interface

data16_001-real_data +

1 **dataset** 450 records

2 1 - 15 order by dataset.created modified created

Bookmark More...

3 Query : amiStatus='VALID' AND ((logicalDatasetName like 'data16_13TeV.%.physics_Main.merge.AOD.%'))

more fields + 4	logicalDatasetName	ecmEnergy	nFiles	totalEvents	totalSize	5
details	data16_13TeV.00311244.physics_Main.merge.AOD.f758_m1616_r9692_r9693_p3134 Rucio - Provenance - GANGA	13.000 TeV	98	226651	84.212 GB	COMA - Per
details	data16_13TeV.00304008.physics_Main.merge.AOD.r9042_r9295_r9643_r9648_p3134 Rucio - Provenance - GANGA	13.000 TeV	350	807309	436.930 GB	COMA - Per
details	data16_13TeV.00311244.physics_Main.merge.AOD.f758_m1616_r9619_r9620_p3134 Rucio - Provenance - GANGA	13.000 TeV	98	226166	97.210 GB	COMA - Per
details	data16_13TeV.00311244.physics_Main.merge.AOD.f758_m1616_r9594_r9595_p3134 Rucio - Provenance - GANGA	13.000 TeV	97	225959	105.020 GB	COMA - Per
details	data16_13TeV.00311244.physics_Main.merge.AOD.f758_m1616_r9557_r9569_p3134 Rucio - Provenance - GANGA	13.000 TeV	98	226177	105.262 GB	COMA - Per
details	data16_13TeV.00307126.physics_Main.merge.AOD.r9544_p3083 Rucio - Provenance - GANGA	13.000 TeV	833	6678358	1.805 TB	COMA - Per

1: # records results

2: default order, most recent first

3: query clause

4: more columns

5: links to other pages

AMI dataset details

dataset | Bookmark | More...

Query : All selected

Metadata

identifier	258969
logicalDatasetName	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906 Rucio - Provenance - GANGA - Series
nFiles	1997
totalEvents	19967000
totalSize	7.735 TB
dataType	AOD
prodsysStatus	EVENTS PARTIALLY AVAILABLE
completion	100.00
ecmEnergy	13.000 TeV
physicsComment	
PDF	
version	e3601_s2997_r8903_r8906 Datasets - AMI-Tags
AtlasRelease	AtlasOffline_21.0.11
crossSection	1.901 nb Repport an error - Jira issues
genFiltEff	1
datasetNumber	361106
principalPhysicsGroup	phys-sm

next slide

Linked entities

EI_METADATA_STATES	1 Records
dataset_extra	5 Records
dataset_keywords	6 Records
files	1997 Records
prodsys_task	1 Records
physicsParameterVals_all	13 Records
physicsParameterVals	8 Records
campaign	1 Records

+2 slides

Extra metadata

beam_energy	6500000
keywords	drellyan, 2electron, electroweak, sm, z, nlo
GenFiltEff_mean	1.0000E+00
crossSection_mean	1.9011E+00
[IOVDbGlobalTag	OFLCOND-MC16-SDR-09-01]

AMI configuration tags

s2997 | view mode | Clone Tag | History | URL

Flat

productionStep	simul
tagType	s
tagNumber	2997
groupName	AtlasProduction
cacheName	20.3.7.3
baseRelease	AtlasProduction_20.3.7
transformationName	Sim_tf.py
description	Clone of s2959 to 20.3.73 with MC15aPlus truth strategy added
created	2016-10-18 10:23:25
createdBy	mhodgkin
modified	2016-10-28 00:25:48
modifiedBy	amiDataLoad
transformation	Sim_tf.py
SWReleaseCache	AtlasProduction_20.3.7.3
DataRunNumber	284500
conditionsTag	"default:OFLCOND-MC16-SDR-09-01"
geometryVersion	"default:ATLAS-R2-2016-00-01-00_VALIDATION"
physicsList	FTFP_BERT_ATL_VALIDATION

physParametersVal: AMI website

physicsParameterVals

8 records

1 - 8 order by physicsParameterVals.created Bookmark More...

Query : dataset.identifier='258969'

more fields +	logicalDatasetName	paramName	paramValue	units	physicsGroup
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	crossSection	1.9011E+00	nb	MCGN
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	crossSectionTotalRelUncertUP	0.05		SUSY
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	crossSectionRef	XsecZleptlept60PowPy		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	kFactor	1.02600047339		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	processGroup	Zjets_PowPy8_incl		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	genFiltEff	1.0000E+00		MCGN
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	mePDF	CT10nlo		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	kFactor	1.026		MCGN

Who responsible
MCGN: numbers automatically extracted from log files by AMI
PMG: manually input by PMG

Script `getMetadata.py` allows you to extract this information (more in a few slides)

pyAMI

https://ami.in2p3.fr/pyAMI/

- python client for AMI
  - can be used from the command line (CLI)
  - can be used from your own scripts (API)

- anything you do on the web interface you can do in pyAMI

- it is available on AFS, CVMFS, and can be installed stand-alone

- on lxplus using cvmfs:

```
> setupATLAS
> lsetup pyami
> voms-proxy-init -voms atlas
```

pyAMI: Command line examples

https://ami.in2p3.fr/pyAMI/

what you can do:

```
> ami list --help
```

listing datasets by pattern:

```
> ami list datasets mc16_13TeV.361106%
```

choosing on AOD:

```
> ami list datasets --type=AOD%
```

runs for a period:

```
> ami list runs -y 2012 -p A3
```

pyAMI: In your own scripts (API)

https://ami.in2p3.fr/pyAMI/

```
################################################################
# IMPORT PYAMI CLIENT MODULE AND API STATIC FUNCTION           #
################################################################
import pyAMI.client
import pyAMI.atlas.api as api
import json

################################################################
# INIT ATLAS API                                               #
################################################################
#api.init()

################################################################
# INSTANTIATE THE PYAMI CLIENT FOR ATLAS                       #
################################################################
client = pyAMI.client.Client('atlas')

################################################################
# USE ATLAS API (http://ami.in2p3.fr/pyAMI/pyAMI5_atlas_api.html)  #
################################################################
patterns = 'mc14_8TeV%AOD%'
fields = 'nfiles,events'
limit = 100
resDict = api.list_datasets(client, patterns = patterns, fields = fields, limit = limit)
################################################################
# PRINT PYTHON DICT AS JSON FORMAT                             #
################################################################
print(json.dumps(resDict,indent=4))
```

more examples here: /afs/cern.ch/user/f/flambert/public/pyAMI5_tutorial

getMetadata.py

- script to get parameter values for your datasets with a command line tool: `getMetadata.py`

physicsParameterVals

8 records

1 - 8 order by physicsParameterVals.created Bookmark More...

Query : dataset.identifier='258969'

more fields +	logicalDatasetName	paramName	paramValue	units	physicsGroup
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	crossSection	1.9011E+00	nb	MCGN
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	crossSectionTotalRelUncertUP	0.05		SUSY
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	crossSectionRef	XsecZleptlept60PowPy		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	kFactor	1.02600047339		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	processGroup	Zjets_PowPy8_incl		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	genFiltEff	1.0000E+00		MCGN
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	mePDF	CT10nlo		PMG
details	mc16_13TeV.361106.PowhegPythia8EvtGen_AZNLOCTEQ6L1_Zee.merge.AOD.e3601_s2997_r8903_r8906	kFactor	1.026		MCGN

- currently only available in AthAnalysis, AthDerivation
- run it once for your analysis to get and store parameter values in a text file
- textfile contains one dataset per line (dsid, xsec, kfactor, filter eff., but more possible)
- https://twiki.cern.ch/twiki/bin/view/AtlasProtected/AnalysisMetadata

```
> setupATLAS
> lsetup pyami 'asetup AthAnalysis,21.2,latest'
> voms-proxy-init -voms atlas
> getMetadata.py --inDsTxt=datasets.txt [--outFile=my.metadata.txt]
```

Luminosity Information

- Luminosity; necessary input to (most) analysis;
  - Measure of the amount of data collected $\mathcal{L}_{\text{int}} \cdot \sigma_p = \text{number of events of interest}$
- TWiki:LuminosityForPhysics
  - Twiki page containing:
    - Recommended text and references for paper
    - Luminosity uncertainty value and special notes
    - Nominal luminosity value
      (also available from the Group GRL area e.g.
      https://atlas-groupdata.web.cern.ch/atlas-groupdata/GoodRunsLists/data18_13TeV/20190708/notes.txt)
    - For specific cases (e.g. with a prescaled trigger, etc), need the GRL file, and follow the instructions at https://atlas-lumicalc.cern.ch/

Data Sample	data18_13TeV
Luminosity Tag	OflLumi-13TeV-010
Luminosity Uncertainty	2.0%
Documentation	Tag validation, uncertainties, combination
Last update for this entry	21 February 2019

- Always good to verify against the data you actually are using in you analysis.

Summary

		Personal use cases:
Run Query	• detailed information about data at *run-level* • useful for detector and operations tasks • nice luminosity plots • web interface and command line	trigger (active, prescales), information by luminosity-block, summary about group of runs (what changed, in common), detector defects, machine conditions, etc.
COMA	• fast information about data in *containers/ periods/runs/lumi-blocks* • overview of configuration/activation of streams and triggers • aggregation of various quantities across projects, periods, etc.	quick overview of runs within periods of interest, period definitions, overview of specific triggers, event counts by trigger
AMI	• catalogue framework for all data and MC datasets • web interface and command-line/API available	understand provenance of a dataset, investigate AMI-tag meanings, get MC metadata for analysis

https://twiki.cern.ch/twiki/bin/view/AtlasComputing/SoftwareTutorialFindingDatasets