# Conditions Metadata and RunBrowser Update

Elizabeth Gallas, Ryan Buckingham - Oxford

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# Outline

- Background: this Conditions Metadata project
- 3 Components, their design principles, status
  - COMA Tables
  - runBrowserReport
  - runBrowser
- Current topic of general interest:
  - Data Periods
- Links and Documentation
- Plans
- Summary

# Background

- Already covered: TAGs, ELSSI, Catalog
- This talk: COMA (Conditions Metadata)
  - A collection of selected/derived Run/LB-wise Conditions
  - Originally built to support dynamic queries of TAG DB
- Detailed Run-wise selection in ELSSI … difficult … decided:
  - ELSSI would be the Event-wise browser
  - RunBrowser would be the Run-LB-wise browser
    - Which communicates with e.g. ELSSI via xml (GRL)
- The fundamental components are:
  - **COMA Relational Database tables** Topic 1
  - RunBrowser Interfaces: Topic 2
    - **runBroswerReport** – report interface for the COMA Tables
    - **runBrowser** – dynamic tool for finding Run/LB of interest

Topic 3

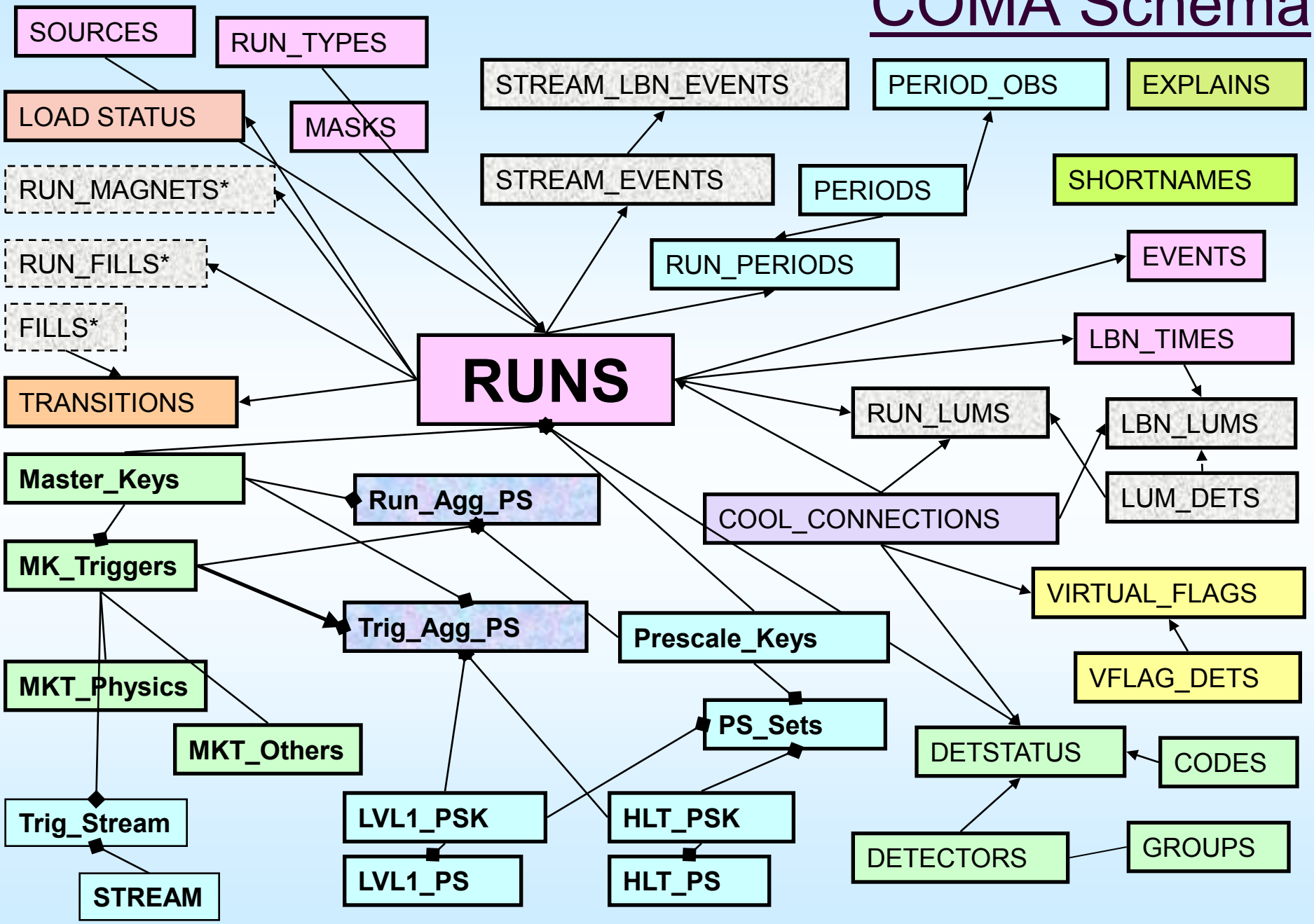
Topic 1

# COMA: General Principles

- Conditions Metadata
  - Will be uploaded from best available sources
  - Into a Relational Database to which ELSSI has easy access
- Must provide information ELSSI needs to decode TAG attributes
- Include information for both Online and MC Runs
  - TAGs for Online/MC have the same attributes (no MC truth)
  - Catalogue for Online/MC reflects similar processing workflows
- Overall system must handle gracefully missing information
- Upload select conditions for Runs of 'analysis interest'
  - Note: NOT all Runs and not all Conditions
  - Only upload Conditions in LOCKED COOL tags (w/cross checks)
- Refine/Correct/Derive conditions to form more effective criteria

- Recently: AMI now has full access to all information in COMA
  - Some schema and data changes may be made to make structures and data better 'connected' to AMI interfaces and its dataset/file/processing metadata

# COMA Schema


SOURCES
RUN_TYPES
STREAM_LBN_EVENTS
PERIOD_OBS
EXPLAINS
LOAD STATUS
MASKS
RUN_MAGNETS*
STREAM_EVENTS
PERIODS
SHORTNAMES
RUN_FILLS*
RUN_PERIODS
EVENTS
FILLS*
LBN_TIMES
RUNS
TRANSITIONS
RUN_LUMS
LBN_LUMS
Master_Keys
Run_Agg_PS
LUM_DETS
COOL_CONNECTIONS
MK_Triggers
VIRTUAL_FLAGS
Trig_Agg_PS
Prescale_Keys
VFLAG_DETS
MKT_Physics
PS_Sets
MKT_Others
DETSTATUS
CODES
Trig_Stream
LVL1_PSK
HLT_PSK
DETECTORS
GROUPS
LVL1_PS
HLT_PS
STREAM

# COMA and Data Periods

Current Data Period implementation:

- AFS files edited by experts – has been a flexible system over this first year of running while use cases solidify
- https://twiki.cern.ch/twiki/bin/view/AtlasProtected/DataPeriods

These Period AFS files → COMA Period tables, updated daily

- Schema, loading stable for the last few months
- DP in COMA: Now used by AMI , Catalog, ELSSI, RunBrowser

Current discussion with Beate (Data Prep), AMI team:

- Best long term storage of Data Periods is in a database
  - Makes it available to a wider variety of systems
  - Generate documentation as in TWiki DataPeriods
    - Automatically from the database, much more customizable !

Proposal:

- Make COMA tables the primary source
  - Upload current descriptions from TWiki to COMA tables
- Work with AMI team to provide interfaces

# COMA / AMI Data Period Interfaces

- Create Data Period Entry interface:
  - Use info in COMA to generate list of candidate runs which should belong to a Data Period (reduces human error and expert effort)
    - Project name, Lum > 0nb-1, ready flag true, DQ atlas_global true (?)
  - Allow creation of
    - New Data Periods (Descriptions, included runs) e.g. B1, B2
    - New 'Parent Periods' (groups of Data Periods) e.g. B
    - New 'Grandparent Periods' … e.g. All_data10_7TeV
  - Introduce 'Locking' mechanism when a Period is closed
    - Upload to COOL if used by any analysis jobs (? Not known ?)
  - Allow modification of Descriptions (at any point)
  - Possibility of 'types' of Data Periods (runs for special studies)
  - Provide authentication mechanisms
- Create Data Period Report interface:
  - Starting point: contents of existing TWiki … content flexible !
- Create Service to report Runs in Data Periods to systems needing it:
  - runQuery, DQ GRL Generator, DP to make containers, … ?
    - currently reading AFS files

Topic 2

# runBrowserReport: General Principles

**runBrowserReport** → Report interface for COMA

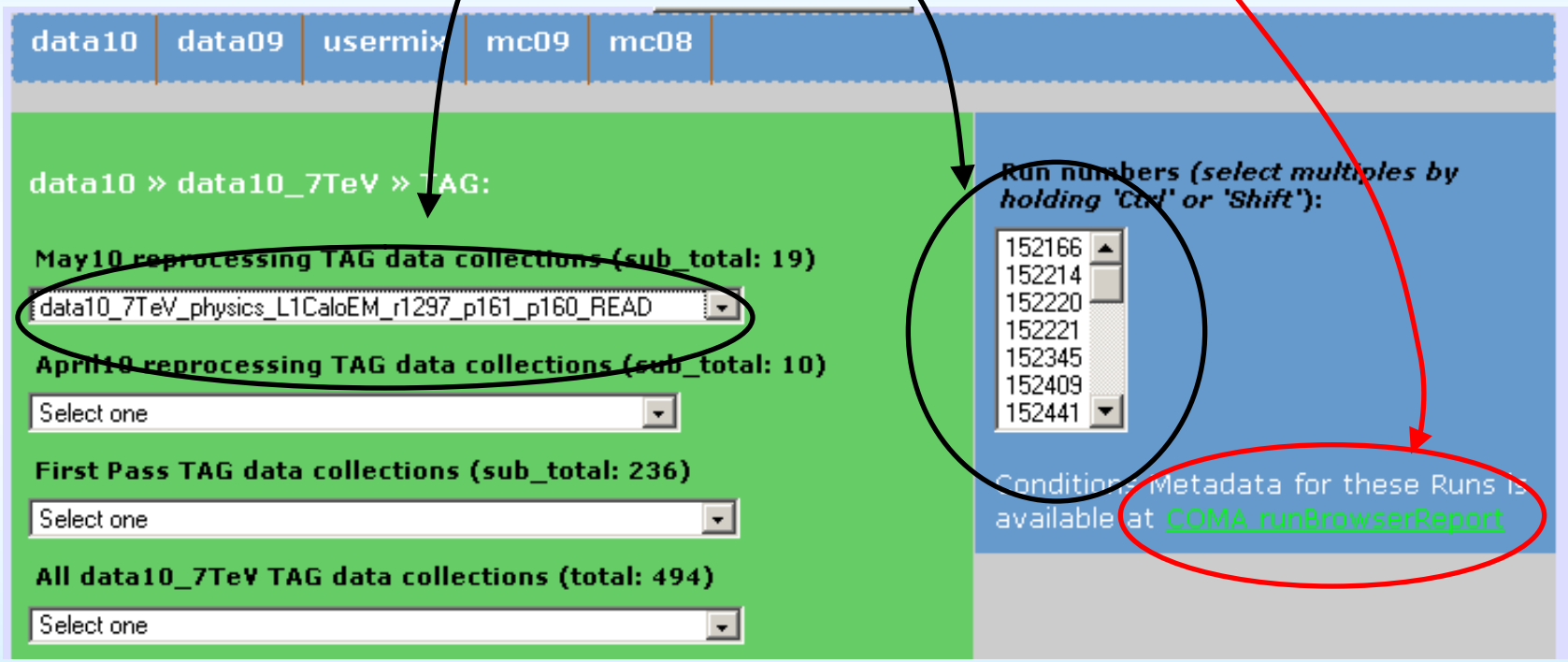
- Display what COMA knows about each Run
  - Useful for COMA loading and cross checks
- Provide links to more detailed information (in other systems)
  - runQuery, AMI, Trigger, Data Quality …reports using COOLCherryPy
- Provide reports distinctive from other systems
  - (Avoid duplication of effort)
  - Display COMA 'derived' information
    - Not available in other systems
- runBrowserReport php uses GET methods:
  - Inputs are not complex, user can modify URL to get report they want, put links into TWiki or other documentation

https://atlas-tagservices.cern.ch/RBR/runBrowserReport.php?runs=161562

- Currently: ELSSI and runBrowser generate links to runBrowserReports for selections in those systems … link in AMI soon (?)

# ELSSI Link to runBrowserReport

- ELSSI contains a new link to runBrowserReports
  - User chooses the Collection Name
  - ELSSI shows Runs in the Collection
  - NEW: ELSSI displays link to pop-up runBrowserReport



# Example runBrowserReport from ELSSI link:

COnditions MetadatA Runs Report

TAG Collection (coll) : data10_7TeV_physics_MinBias_r1297_p161_p160_READ

Run Number (runs) : 152166, 152214, 152220, 152221, 152345, 152409, 152441, 152777, 152844, 152845, 152878, 152933, 152994, 153030, 153136, 153159, 153200, 153565, 153599, 154810, 154813, 154815, 154817

Found 25 Runs with input criteria ...

| RUN | FILENAME_TAG | START_TIME | DURATION | NLBN | TMK | PARTITION | EVENTS | PERIODS |
|---|---|---|---|---|---|---|---|---|
| 154817 | data10_7TeV | 2010-MAY-09 07:19:48 | 37719 seconds (10:28:39) | 325 [1-325] | 788 | ATLAS | 11348226 | B,B1 |
| 154815 | data10_7TeV | 2010-MAY-09 05:46:38 | 4624 seconds (1:17:04) | 41 [1-41] | 788 | ATLAS | 1347283 | B,B1 |
| 154813 | data10_7TeV | 2010-MAY-08 22:58:03 | 23369 seconds (6:29:29) | 195 [1-195] | 788 | ATLAS | 5620746 | B,B1 |
| 154810 | data10_7TeV | | | | | | 2309 | B,B1 |
| 153599 | data10_7TeV | | | | | | 0563 | B,B1 |
| 153565 | data10_7TeV | 17:06:54 | (39:55:04) | [1-1202] | | | 30467 | B,B1 |
| 153200 | data10_7TeV | 2010-APR-18 21:31:30 | 20893 seconds (5:48:13) | 183 [1-183] | 770 | ATLAS | 1723618 | A |
| 153159 | data10_7TeV | 2010-APR-18 06:58:50 | 21345 seconds (5:55:45) | 186 [1-186] | 770 | ATLAS | 2453962 | A |
| 153136 | data10_7TeV | 2010-APR-17 | 30383 seconds | 263 | 770 | ATLAS | 007721 | A |

**1. Click on link in ELSSI …**

**This report displays basic Run information for all Runs in the chosen collection (start time, LBs, period…)**

**2. Click on a specific Run link …**

**Will generate a rBR single Run report with more information about that Run**

# runBrowserReport: Reports available

RBR **Run Report** (Run 161562):

https://atlas-tagservices.cern.ch/RBR/runBrowserReport.php?runs=161562

- General Run information, AMI tags, DQ, Prescale Evolution, Triggers
  - Trigger tables show derived Run-integrated prescale, passthrough

RBR **Master Key Report** (Key 877):

https://atlas-tagservices.cern.ch/RBR/runBrowserReport.php?tmk=877

- Runs using this TMK, physics/commissioning chains, Level 1 items

RBR **Chain Report** (Chain EF_g11_etcut):

https://atlas-tagservices.cern.ch/RBR/runBrowserReport.php?cn=EF_g11_etcut

- Summary: TMK,Runs with this chain
- Runs with this trigger 'active'

RBR **Chain Wildcard Report** (chain name matching string EF_g1%):

https://atlas-tagservices.cern.ch/RBR/runBrowserReport.php?cn=EF_g1%

- Summary: TMK,Runs with this chain, activation in Runs

RBR **Prescale Report** (Run 162882 Prescales for chain EF_g11_etcut):

https://atlas-tagservices.cern.ch/RBR/runBrowserReport.php?runs=162882&cn=EF_g11_etcut

- Derived chain activity over the Run and LB-wise prescales

Topic 3

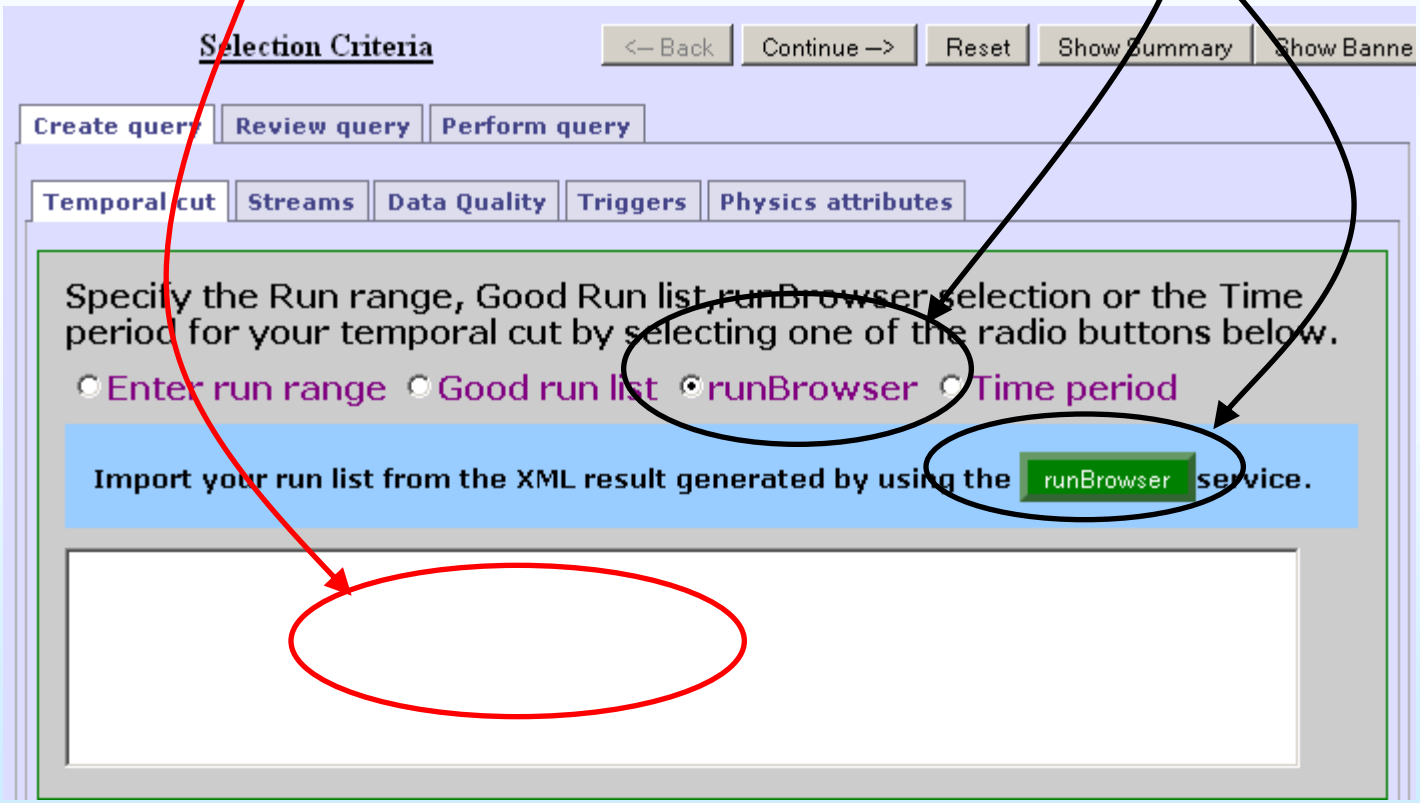
# runBrowser: General Design Principles

**runBrowser** = interface for RunLB selection using COMA Tables

- Purpose: Make conditions metadata available as selection criteria in advance of analysis … Envisioned as the Run-level browser for ELSSI … current implementation makes it also available stand-alone.
  - Intermediate results may be what the user is looking for
    I.E. show me the Runs taken on this date, during a Data Period, or w/this DQ tag.
  - Final output (clicking on "Finish" button):
    LB level criteria is applied at the final "Finish" stage.
    Output: A report showing the Run/LBs passing final criteria
    Output: An xml file (GoodRunList) which can be used by ELSSI etc.
- runBrowser IS NOT runQuery (browser to all online Runs in COOL)
- Enables not only Run selection by conditions criteria but also displays the possible values of remaining criteria and its relationship to other criteria
- Criteria can be imposed in any order …
  - some choices open selection to deeper criteria
- Where appropriate:
  - Allows radio, checkbox, or text (command line) entry of criteria
  - Allow list and/or ranges of values, wildcards, case insensitivity ...
- Incorporate features to customize rows displayed and other tricks to improve performance

# ELSSI can now launch runBrowser

- ELSSI can launch runBrowser on the “temporal”
  - Choose the runBrowser radio button
  - Click on the green runBrowser button
    - launches runBrowser in new window
    - After Run/LB selection, click on FINISH, click on ELSSI button
    - RunLB xml result is returned into the text area below



# runBrowser Overview


- Note: “Under Construction”!
- Each section expands/collapses showing the available values
- Blue links:
  - pop up documentation
- Choose ANY criteria, ANY order, click SUBMIT
  - runBrowser now tells you what is left … iterate until you are happy
- Selection Sections

  → see next slide
- Click on FINISH button
  - when you are finished making selections

  → Shown after next slide


# rB Selection Criteria

Sections

1. Purpose / Instructions
2. Selection Summary
   - → Starts out empty (stand-alone)
   - → Starts with Collection (ELSSI)
3. Selection Criteria
   - A. Uploaded Runs
   - B. Temporal Selection
   - C. Data Periods
   - D. Data Source (data or MC)
   - E. Run Type
   - F. Project Name (FilenameTag)
   - G. DAQ Configuration
   - H. Run Number
   - I. Stable Beams (*)
   - J. Ready Status Flag (*)
   - K. Trigger Master Key
   - L. Data Quality
     - ■ Virtual Flags (demo)

# Documentation and Links

## Interface Links (ELSSI, RunBrowser):

- TAG Services portal:

  **https://atlas-tagservices.cern.ch/**

  (click on the latest versions)

## Documentation

- COMA Schema:

  **http://www-pnp.physics.ox.ac.uk/~gallas/TAGs/Run_Metadata_ERD_1011.ppt**

- COMA Tables:

  **https://gallas.web.cern.ch/gallas/COMA_Tables.html**

- runBrowserReport:

  **https://atlas-tagservices.cern.ch/RBR/rBR_Documentation.html**

# Summary

Summarized: components of the COMA project

- COMA tables – the relational DB tables
- RunBrowser Package
  - runBrowser – the Browser interface for COMA
  - runBrowserReport – the Report interface for COMA

Data content/Interfaces under development to improve

- Functionality and Usability

Proposal on the table: make COMA the source for DataPeriods

- Technical challenge: Combines information from Conditions DB with human (expert) data entry
- Success in this area will demonstrate feasibility to use in the area of Data Quality and GRL integration

Many areas of activity not mentioned here

- An evolving/growing system

Success depends on user feedback

- hn-atlas-physicsMetadata@cern.ch

# Backup

# COMA Summary

This is an evolving system … current information in the system is growing based on information available and use cases

- → Adding more dimensions to the Conditions data
  - → With suitable relationships to facilitate queries
- → Making that criteria available in a dynamic useable interface

We want to insure the Metadata is

- → complete enough to satisfy use cases while
- → reflecting accurately its limitations

Interfaces are being constructed to use selection syntax, criteria, and communication in common use in ATLAS

i.e. runQuery, GoodRunList xml …

This facilitates cross checks with other systems

Continuous process: talking with various experts to ensure

data integrity, completeness, compatibility w/other systems

… We've had positive informal feedback from physics and commissioning people so far …

# ELSSI Portal: https://cern.ch/tagservices


Atlas WEB/PHP services for event selection via TAGs. For comments/suggestions please refer to ATLAS Physics Metadata Hypernews

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**ELSSI Website for Relational TAGS**
**You must have a grid certificate for access.Please choose the server nearest you:**

- CERN ELSSI 04-00-03
- BNL (USA, Brookhaven, NY ) ELSSI 03-01-01
- TRIUMF (Canada, Vancouver) ELSSI Portal

- RunBrowser Latest version(00-04-00)
- RunBrowser Previous version(00-03-00)

**Information Twikis:**

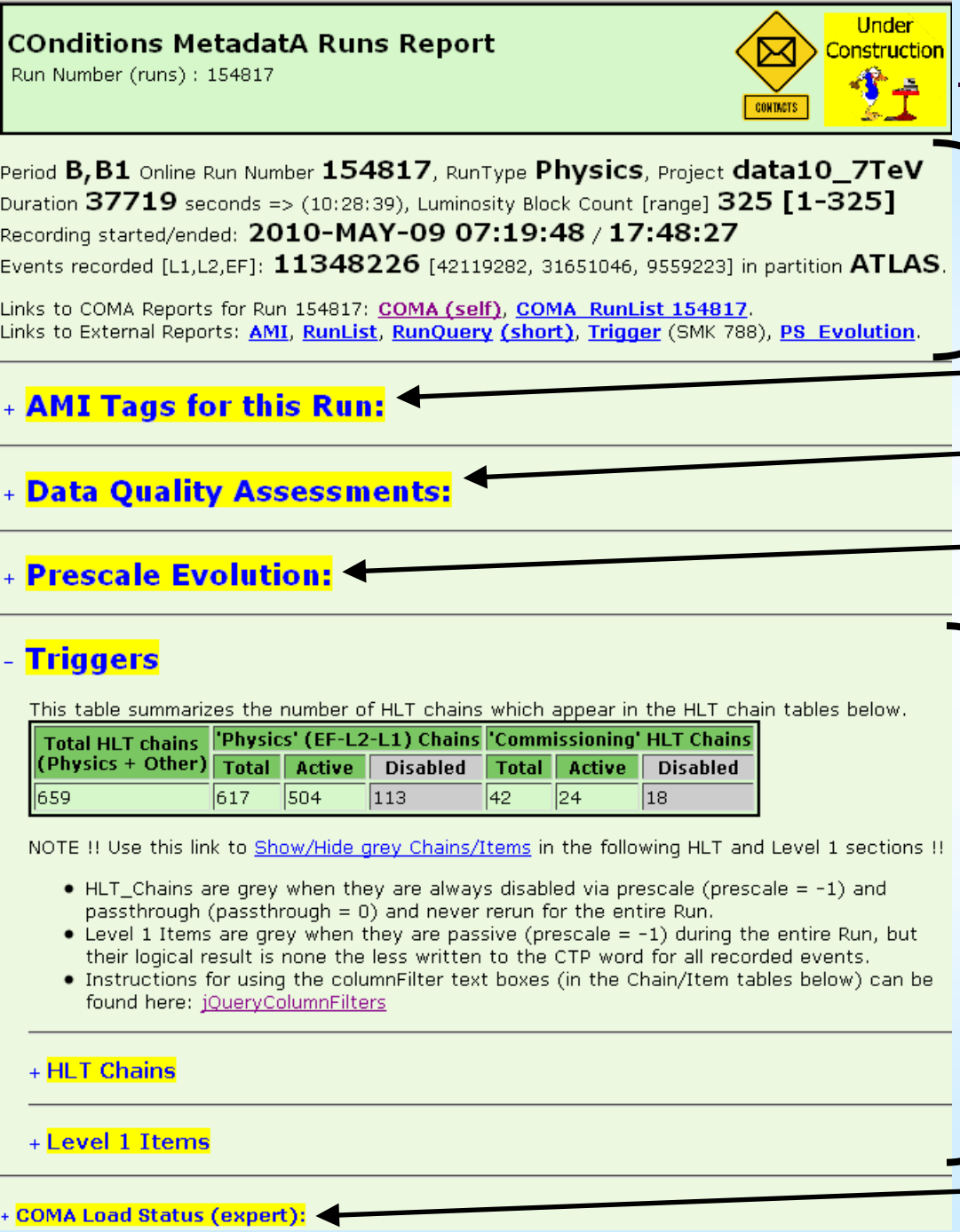
- TUTORIAL: Using ELSSI, the Tag Database Portal
- Introduction to tags and tag content

- Production Visitors statistics (awstats)
- EventLookup Visitors statistics on the old lxvm0341
- Development Visitors statistics (awstats)

Newest ELSSI production version

Tour of ELSSI starts here …
(https://cern.ch/tagservices)
Note: grid certificate required.

# rBReport: single Run Overview

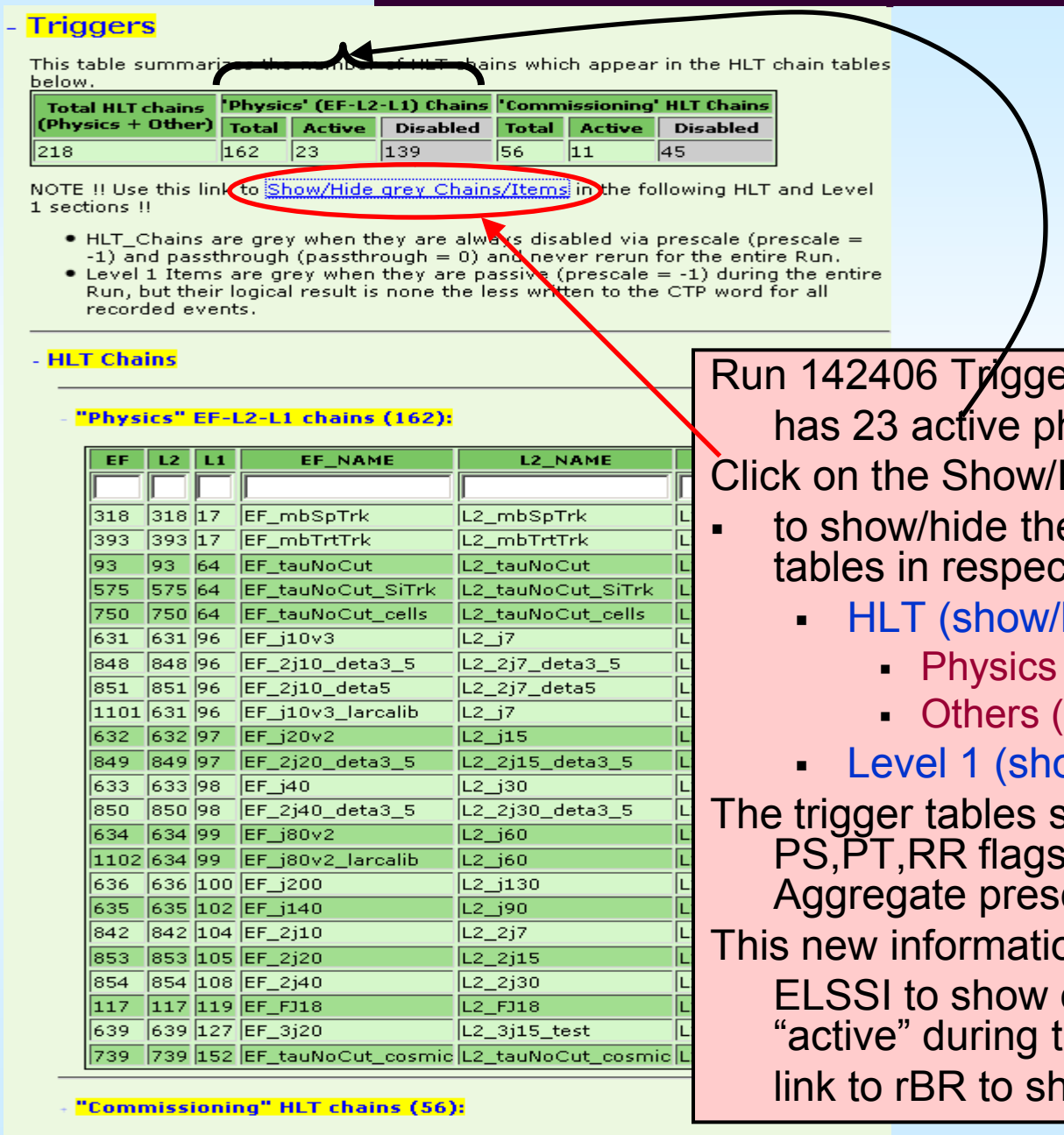



Each Yellow section expands … This report has 5 Primary sections, the Trigger section has subsections

- General Run info
  - Period, LB range, Date …
  - Links to external reports
- AMI tags for this Run
  - In the TAG Catalog schema
- DQ LBSUMM assessments
  - COOL tagged/locked
- Prescale Evolution
  - How many times did prescales change during the Run
- Trigger section
  - Has an HLT summary
    - Counts of active/disabled
  - Has expanding subsections
    - HLT Chains (2 subsections)
      - Physics
      - Commissioning
    - Level 1 Items
- COMA Load Status

# runBrowserReport : Trigger Section

**Trigger Section of runBrowerReport for Run=142406**



- Triggers

This table summarizes the number of HLT chains which appear in the HLT chain tables below.

| Total HLT chains (Physics + Other) | 'Physics' (EF-L2-L1) Chains | | | 'Commissioning' HLT Chains | | |
|---|---|---|---|---|---|---|
| | Total | Active | Disabled | Total | Active | Disabled |
| 218 | 162 | 23 | 139 | 56 | 11 | 45 |

NOTE !! Use this link to Show/Hide grey Chains/Items in the following HLT and Level 1 sections !!

- HLT_Chains are grey when they are always disabled via prescale (prescale = -1) and passthrough (passthrough = 0) and never rerun for the entire Run.
- Level 1 Items are grey when they are passive (prescale = -1) during the entire Run, but their logical result is none the less written to the CTP word for all recorded events.

- HLT Chains

"Physics" EF-L2-L1 chains (162):

| EF | L2 | L1 | EF_NAME | L2_NAME | L |
|---|---|---|---|---|---|
| 318 | 318 | 17 | EF_mbSpTrk | L2_mbSpTrk | L |
| 393 | 393 | 17 | EF_mbTrtTrk | L2_mbTrtTrk | L |
| 93 | 93 | 64 | EF_tauNoCut | L2_tauNoCut | L |
| 575 | 575 | 64 | EF_tauNoCut_SiTrk | L2_tauNoCut_SiTrk | L |
| 750 | 750 | 64 | EF_tauNoCut_cells | L2_tauNoCut_cells | L |
| 631 | 631 | 96 | EF_j10v3 | L2_j7 | L |
| 848 | 848 | 96 | EF_2j10_deta3_5 | L2_2j7_deta3_5 | L |
| 851 | 851 | 96 | EF_2j10_deta5 | L2_2j7_deta5 | L |
| 1101 | 631 | 96 | EF_j10v3_larcalib | L2_j7 | L |
| 632 | 632 | 97 | EF_j20v2 | L2_j15 | L |
| 849 | 849 | 97 | EF_2j20_deta3_5 | L2_2j15_deta3_5 | L |
| 633 | 633 | 98 | EF_j40 | L2_j30 | L |
| 850 | 850 | 98 | EF_2j40_deta3_5 | L2_2j30_deta3_5 | L |
| 634 | 634 | 99 | EF_j80v2 | L2_j60 | L |
| 1102 | 634 | 99 | EF_j80v2_larcalib | L2_j60 | L |
| 636 | 636 | 100 | EF_j200 | L2_j130 | L |
| 635 | 635 | 102 | EF_j140 | L2_j90 | L |
| 842 | 842 | 104 | EF_2j10 | L2_2j7 | L |
| 853 | 853 | 105 | EF_2j20 | L2_2j15 | L |
| 854 | 854 | 108 | EF_2j40 | L2_2j30 | L |
| 117 | 117 | 119 | EF_FJ18 | L2_FJ18 | L |
| 639 | 639 | 127 | EF_3j20 | L2_3j15_test | L |
| 739 | 739 | 152 | EF_tauNoCut_cosmic | L2_tauNoCut_cosmic | L |

"Commissioning" HLT chains (56):

Run 142406 Trigger Summary shows:

has 23 active physics chains (of 162)

Click on the Show/Hide link

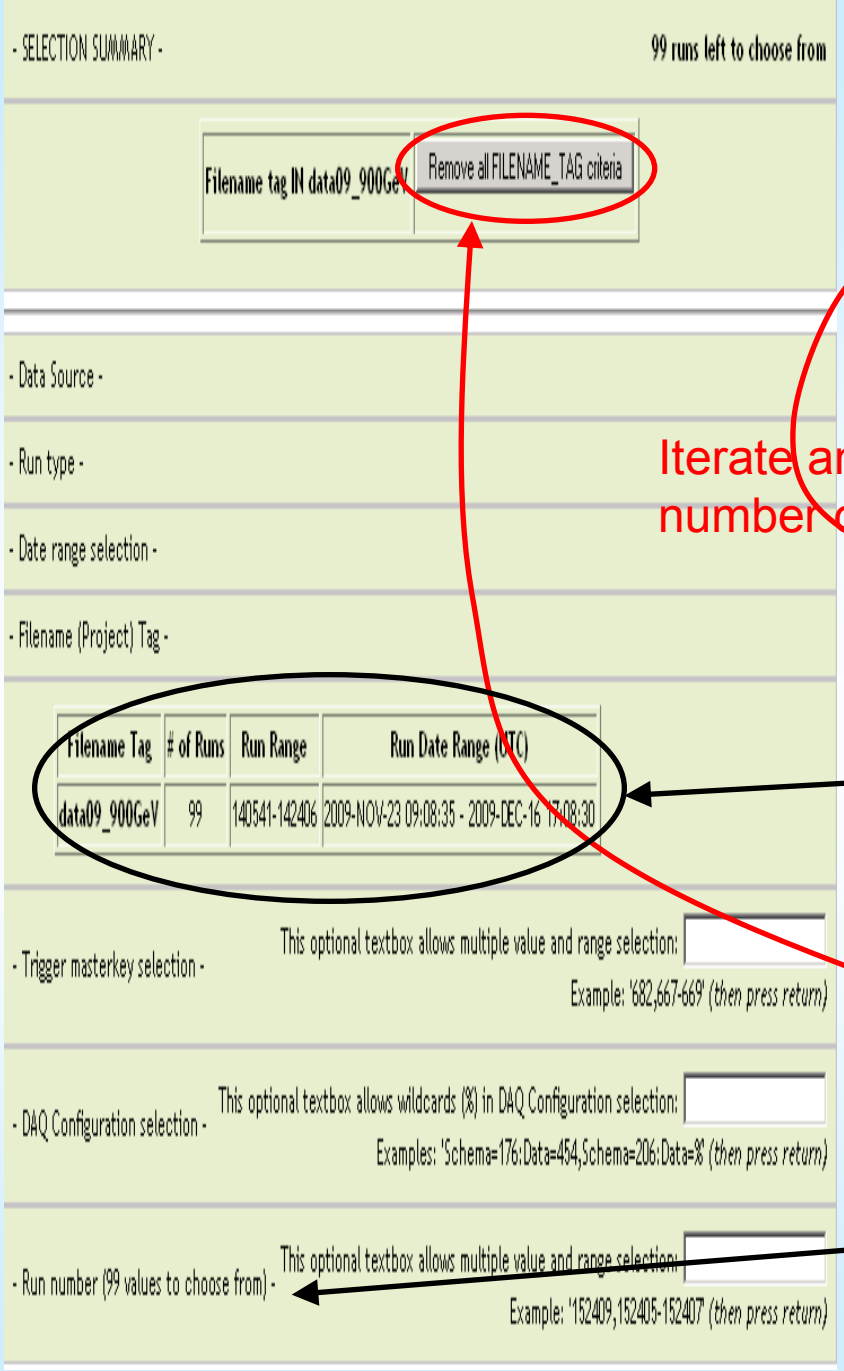
- to show/hide the grey rows of chain/items tables in respective subsections:
  - HLT (show/hide disabled chains)
    - Physics (complete EF-L2-L1 chains)
    - Others (commissioning chains)
  - Level 1 (show/hide passive items)

The trigger tables show the prescale range and PS,PT,RR flags of the new derived “Run Aggregate prescale” COMA tables

This new information allows:

ELSSI to show only chains which are “active” during the Run

link to rBR to show all chains.




Iterate any number of times

Example demonstrates General Principles:

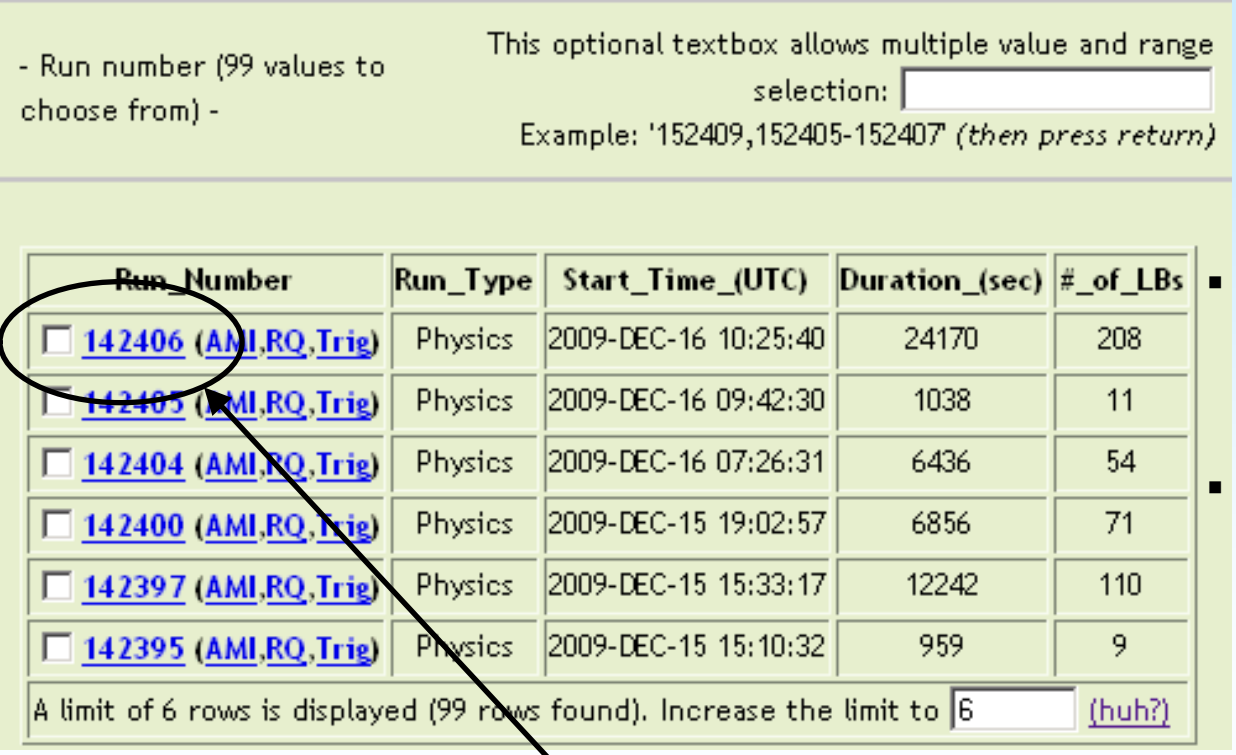
- There is no prescribed order of selection or mandatory selections
- Expand section of interest, make selection:
  - available radio/checkbox or use the textbox to type a list or range of values
  - Click Submit

I chose Project "data09_900GeV", then

- ere are 99 Runs left
- eir run and date range

- I see the criteria has appeared in the selection summary
  - I could remove it with button click
- I see ALL the other sections have changed to reflect this criteria !
  - Look at the remaining 99 runs .. (next slide)

# runBrowser
## Run Number Section




- Click on the Run Section to open it … the run numbers appear
- Run selection is NOT mandatory … you can go onto FINISH without any Run explicitly selected

The Run Section includes links to other systems

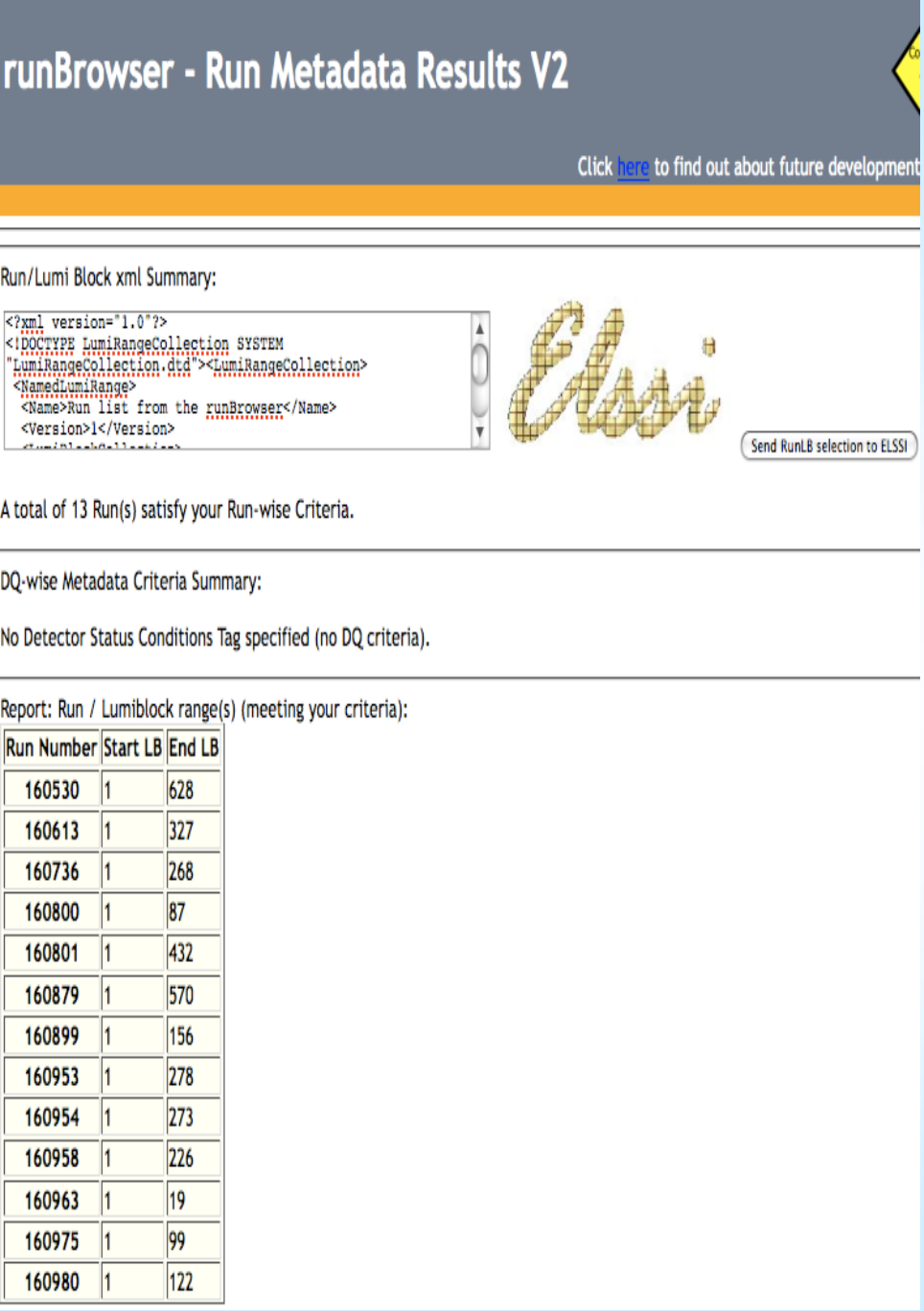
- Click on the Run Number → generates the runBrowserReport
- Other links are to AMI, RunList, and Trigger Reports for that Run number

Other related selections to be added to runBrowser2:

1. Run Duration
2. Number of LB
3. Number of Events Recorded

Next slide:
runBrowserReport
for Run number 142406

# rB Finish Button




| Run Number | Start LB | End LB |
|---|---|---|
| 160530 | 1 | 628 |
| 160613 | 1 | 327 |
| 160736 | 1 | 268 |
| 160800 | 1 | 87 |
| 160801 | 1 | 432 |
| 160879 | 1 | 570 |
| 160899 | 1 | 156 |
| 160953 | 1 | 278 |
| 160954 | 1 | 273 |
| 160958 | 1 | 226 |
| 160963 | 1 | 19 |
| 160975 | 1 | 99 |
| 160980 | 1 | 122 |

Output:

- GOOD RUNS LIST xml
  - w/link to send to ELSSI
- A humanly readable report…
  - Table of Run LB Ranges
  - List of criteria
  - Report of why particular LB ranges failed DQ criteria

-- This is a first release of "runBrowser"
***But*** the data content and functionality is **still in development.**–
This version should give people an idea of what the system will be able to do…
Ideas and feedback is very welcome!