Fermilab Muon g-2

Managed by Fermi Research Alliance, LLC for the U.S. Department of Energy Office of Science

Muon g-2 Offline Production Shifts

Tammy Walton

FIFE Meeting

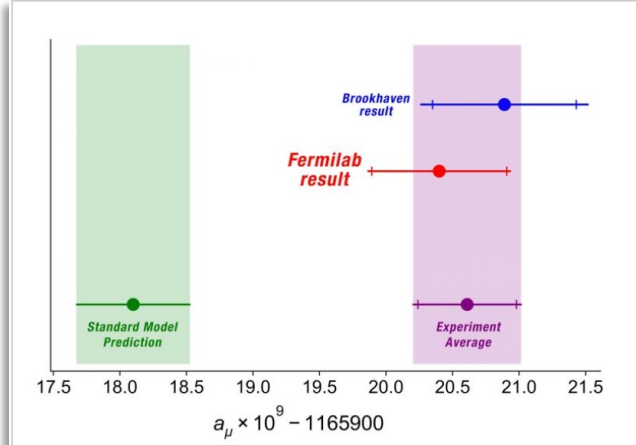
January 20, 2022

Outline

- Motivation
- Overview of Production Workflow
- Production Shifts
  - Preproduction
  - Constants Analysis
  - Full Production
  - Data Quality
- Performance
- Summary

Motivation

- Brief History of Run1 Data
  - March 22, 2019: Beginning of Run1 data taking
  - July 20, 2019: Ending of Run1 data taking
  - February 2021: Final Production Completed
  - April 7, 2021 : Muon g-2 announced the first results



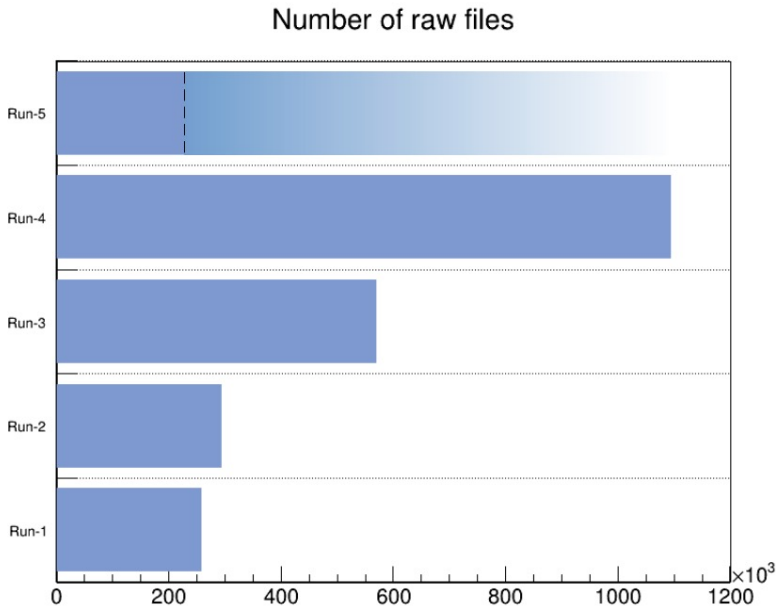
The first result from the Muon g-2 experiment at Fermilab confirms the result from the experiment performed at Brookhaven National Lab two decades ago. Together, the two results show strong evidence that muons diverge from the Standard Model prediction. Image: Ryan Postel, Fermilab/Muon g-2 collaboration

Motivation

	Raw	Nearline	Offline	Field
Run1	0.4 PB	-	2.2 PB	29 TB
Run2	0.5 PB	11 TB	2.5 PB	48 TB
Run3	1.0 PB	18 TB	2.5 PB*	87 TB
Run4	2.0 PB	35 TB	0.2 PB*	98 TB

*Under production

- It took 2 years to complete the final data production for Run1
- Reprocess the data many times
- A raw file is about 2GB and generated every 30 seconds
- Implemented improvements to the production workflow in order to keep up with the data rate



Courtesy of P. Girotti

Outline

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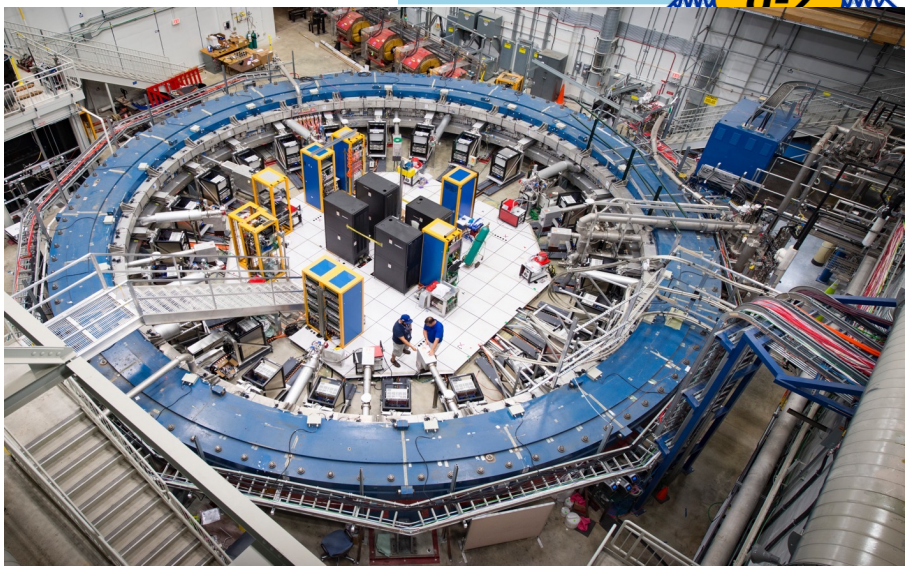
Overview of Production Workflow



- Muons circulate the storage ring for about 700 us

- Reconstruct physics objects for many systems
  - Auxiliary systems such as Kicker magnets, T0, IBMS
  - Laser calibration system
  - 24 Calorimeters (1296 channels)
  - 2 Trackers (2048 channels)

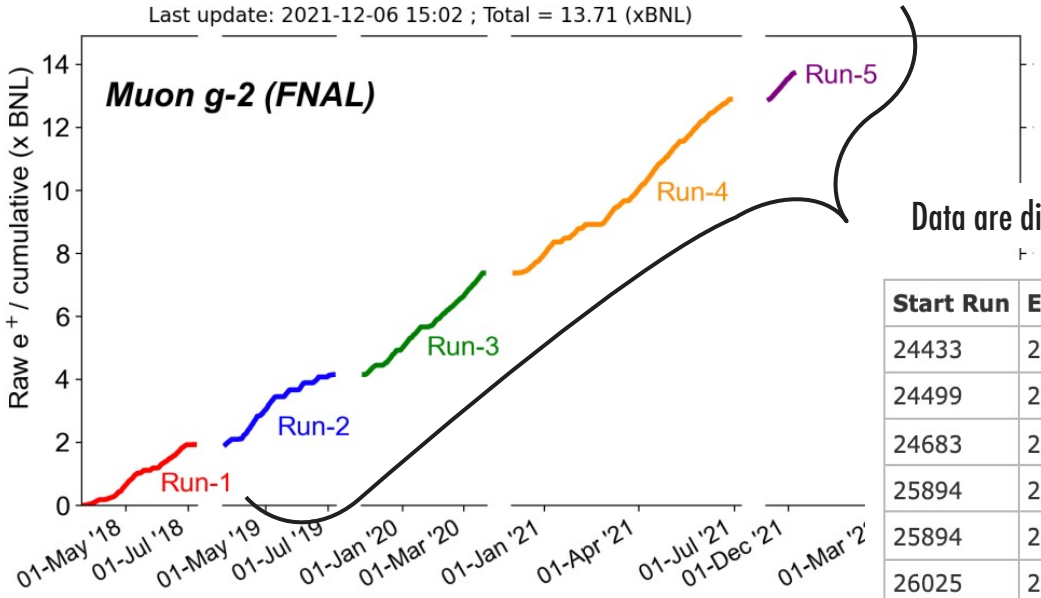
- Many calibrations and data quality checks
  - Kicker system
  - T0 monitoring
  - Laser system
  - Quadrupoles and Magnet

- Run2 and beyond
  - Use condition database for all calibration and data quality constants

  - Use multiple fhicl files to process the data
    - Process the data sequential
      1. Unpack the data (serialization) and create objects for the auxiliary detectors
      2. Reconstruct the calorimeter physics objects that requires pulse fitting routine
      3. Reconstruct the tracking physics objects
      4. Reconstruct the calorimeter physics objects that integrates over 300us waveform
    - On average this production scheme requires 2GB of memory

  - Implemented a rolling production scheme

Rolling Production Workflow

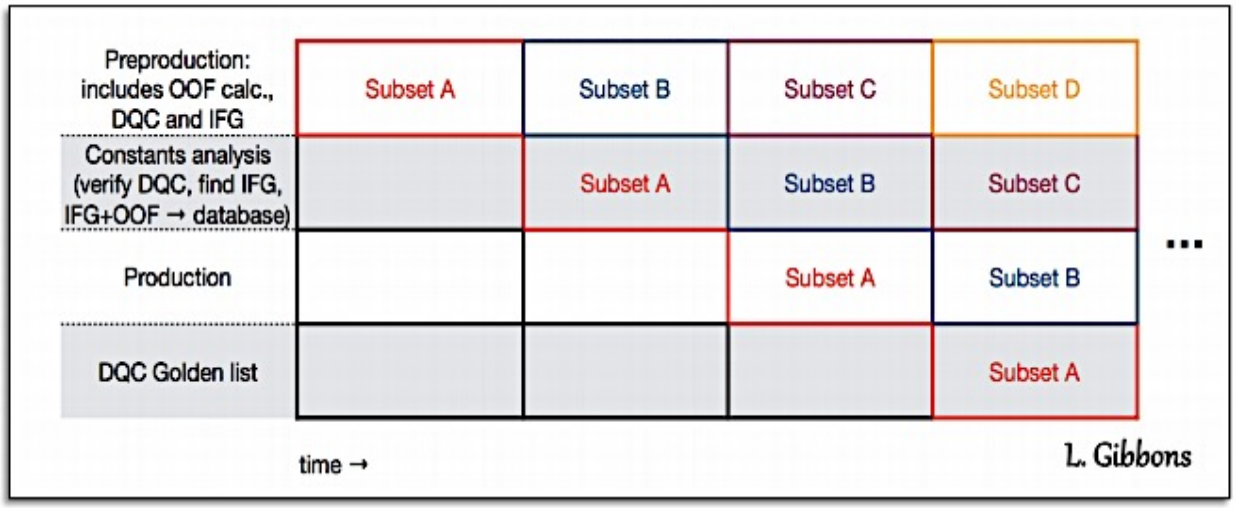


Data are divided into subsets based on physics and operations

Start Run	End Run	Dataset Name	nFiles
24433	24474	gm2pro_daq_raw_run2_PreProd_A	7832
24499	24648	gm2pro_daq_raw_run2_PreProd_B	24403
24683	25045	gm2pro_daq_raw_run2_PreProd_C	90680
25894	26384	gm2pro_daq_raw_run2_PreProd_D	88503
25894	26024	gm2pro_daq_raw_run2_PreProd_D1	37680
26025	26384	gm2pro_daq_raw_run2_PreProd_D2	50823
26459	26624	gm2pro_daq_raw_run2_PreProd_E	36789
26675	26804	gm2pro_daq_raw_run2_PreProd_F	30955
26996	27043	gm2pro_daq_raw_run2_PreProd_G	9685
27166	27215	gm2pro_daq_raw_run2_PreProd_H	13192
27415	27439	gm2pro_daq_raw_run2_PreProd_I	4602

Run2 table

Rolling Production Workflow

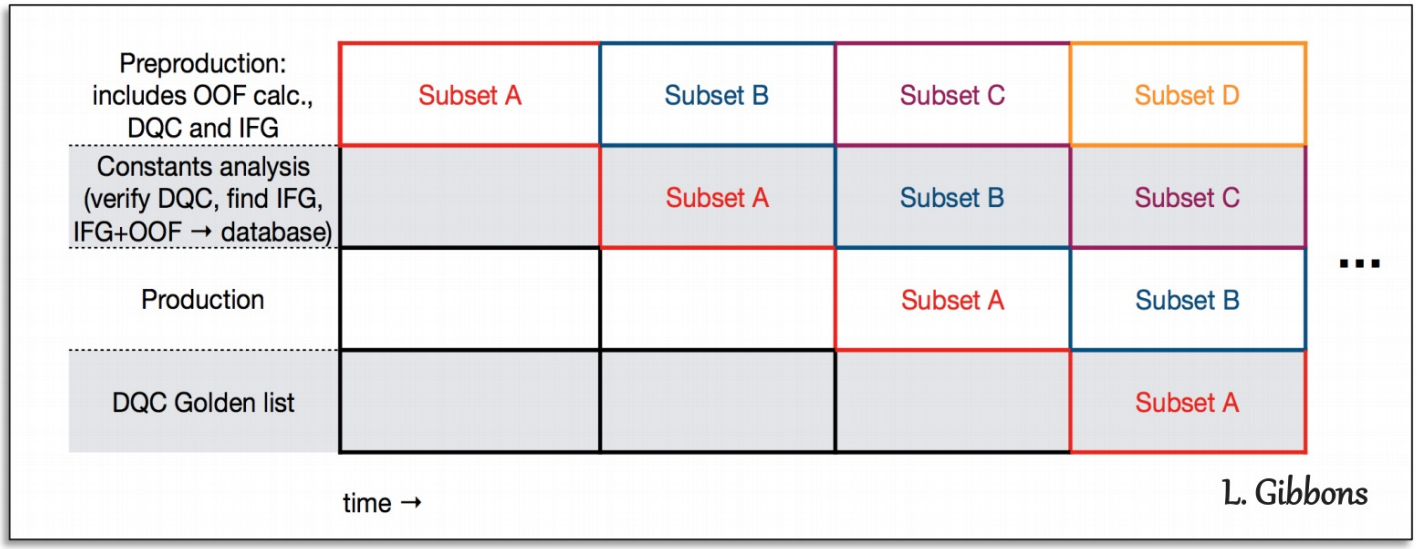


1. Preproduction: processing the data using the minimal reconstruction that is needed for extracting the gain calibration and in-fill DQC constants
2. Constants Analysis: analyzing the constants that is followed by adding them to the database
3. Full Production: processing the data using the full reconstruction that uses calibration constants and in-fill DQC
4. DQC Analysis: analyzing and quantifying the quality of the data

Production Shift Motivation

- Brief History of Run2 Data
  - March 2019: Beginning of Run2 data taking
  - July 2019: Ending of Run2 data taking
  - Summer 2019: Implemented Using Condition Database
  - Fall 2019: Implemented the Rolling Production Scheme
  - Winter 2019: Begin First Processing of Run2 data
  - Spring 2021: Search for Production Manager(s)
  - Spring 2021: First Discussion of Offline Production Shifts
  - Fall 2021: Completed Run2 Data Processing

Overview of Production Workflow



- We need production shifters to help with the following:
  - Preproduction
  - Full Production
  - Data Quality Analysis

- The calibration and DQC teams are responsible for the constants analyses

Overview of Production Workflow

- Google spreadsheet is used for the bookkeeping

		Done	All done!															
		Skipped	Removed															
					Constants analysis (experts)													
Dataset	Pre-staging	Pre-production	2nd stages	hadd stages	IFG	OOF	QMethod	Laser DQC	Kicker DQC	T0 DQC	Channel status	Pre-staging	Full production (test)	DQC (test)	Full production	Recovery	Subrun DQC	Dataset delivered
2A	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
2B	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2C	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2D	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2E	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2F	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2G	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2H	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
2I	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
3A	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
3B	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
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3H	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
3I	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
3J	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
3K	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	TODO
3L	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
3M	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
3N	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
3O	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done
4A	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done							
4B	Done	Done	Done	Done	Done	Done	Done	Done	In progress	Done	Done							
4C	Done	Done	Done	Done	Done	Done	Done	Done	In progress	TODO	Done							
4D	Done	Done	Done	Done	Done	Done	Done	Done	In progress	TODO	Done							
4E	Done	In progress	In progress	In progress														
4F	Done	In progress	In progress	In progress														
4G	Done	TODO	TODO	TODO														

Preproduction

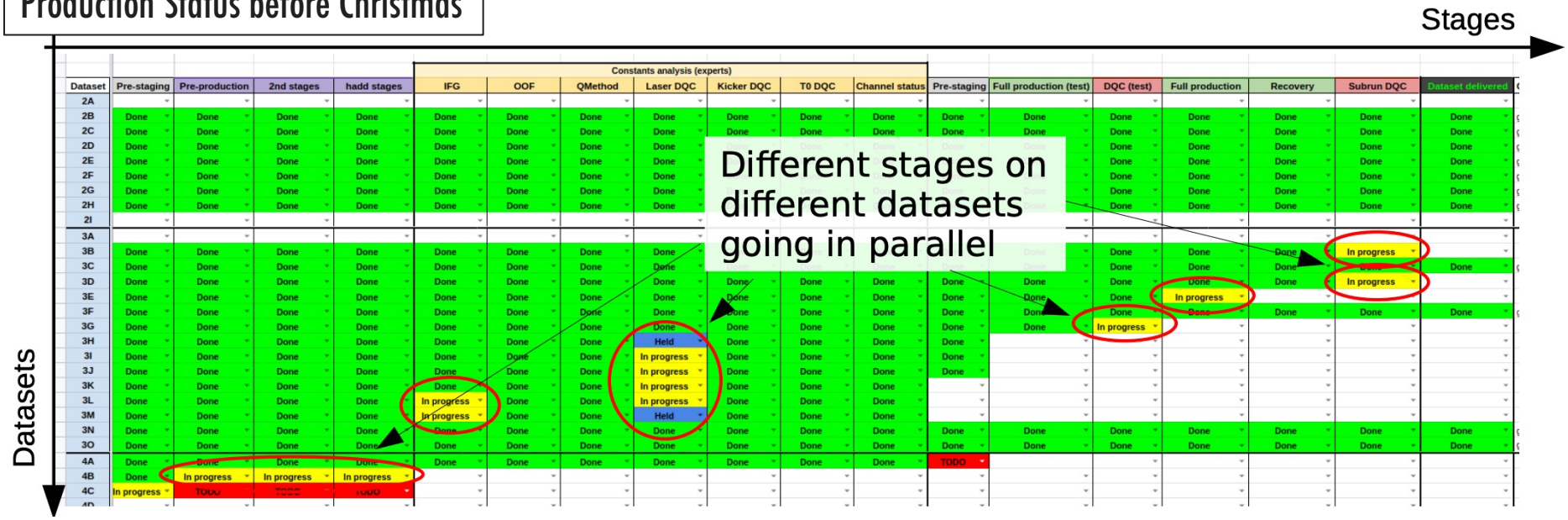
Constants Analysis

Full Production and DQC

Overview of Production Workflow

- Google spreadsheet is used for the bookkeeping

Production Status before Christmas



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2D	Done	Done	Done	Done	Done	Done	Done	Done						Done	Done	Done	Done	Done
2E	Done	Done	Done	Done	Done	Done	Done	Done						Done	Done	Done	Done	Done
2F	Done	Done	Done	Done	Done	Done	Done	Done						Done	Done	Done	Done	Done
2G	Done	Done	Done	Done	Done	Done	Done	Done						Done	Done	Done	Done	Done
2H	Done	Done	Done	Done	Done	Done	Done	Done						Done	Done	Done	Done	Done
2I																		
3A																		
3B	Done	Done	Done	Done	Done	Done	Done	Done						Done	Done	Done	In progress	
3C	Done	Done	Done	Done	Done	Done	Done	Done						Done	Done	Done		Done
3D	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	In progress	
3E	Done	Done	Done	Done	Done	Done	Done	Done						Done	In progress			
3F	Done	Done	Done	Done	Done	Done	Done	Done								Done	Done	Done
3G	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	In progress				
3H	Done	Done	Done	Done	Done	Done	Done	Held	Done	Done	Done	Done						
3I	Done	Done	Done	Done	Done	Done	Done	In progress	Done	Done	Done	Done						
3J	Done	Done	Done	Done	Done	Done	Done	In progress	Done	Done	Done	Done						
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3L	Done	Done	Done	Done	In progress	Done	Done	In progress	Done	Done	Done							
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4A	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	Done	TODO						
4B	Done	In progress	In progress	In progress														
4C	In progress	TODO	TODO	TODO														

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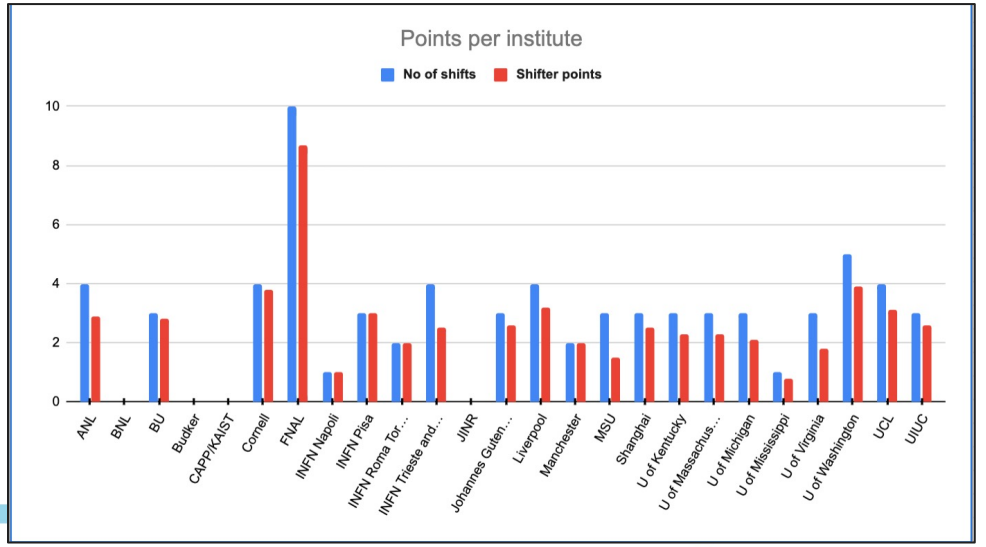
Brief Overview of Production Shifts

- Collaboration agreed production shifts are needed
  - Small institutions are not required to take shifts
- Shifts points are assigned
  - Points depend on the workload
- Modelled the production shifts similar as DAQ operation shifts
  - Elog Checklists
  - Slack channels
  - Detailed step-by-step instructions
  - Experts on call
  - Shift block: 7 days
    - Hours are flexible



Brief Overview of Production Shifts

-> Jump to this week <- institution and name from the pull-down menu. Begin typing your name and the list of options will autocomplete.

Production shifts	November			December		
Week Of (Starting Day)	16 Nov 2021	23 Nov 2021	30 Nov 2021	7 Dec 2021	14 Dec 2021	21 Dec 2021
Pre-Production	BU	FNAL	FNAL	U of Washington	U of Washington	FNAL
0.80 pts	Andy Edmons	Lisa Goodenough	Saskia Charity	Christine Claessens	Brynn MacCoy	Hogan Nguyen
Expert on call	Tammy Walton	Paolo Girotti	Tammy Walton	Tammy Walton	Tammy Walton	Yuri Oksuzian
Full-Production (shifter A)	UCL	INFN Pisa	Cornell	FNAL	U of Kentucky	Shanghai
1.00 pts	Dominika Vasilkova	Elia Bottalico	Kevin Labe	Saskia Charity	Renee Fatemi	Yuekai Hu
Full-Production (shifter B)	Johannes Gutenberg University Mainz	Shanghai	FNAL	U of Massachusetts	FNAL	FNAL
1.00 pts	Rene Reimann	Yuekai Hu	Brendan Casey	David Kessler	James Mott	James Mott
Expert on call	Liang Li	Liang Li	Liang Li	Yuri Oksuzian	Yuri Oksuzian	Liang Li
Subrun DQC (shifter A)	U of Washington	U of Virginia	U of Michigan	Johannes Gutenberg University Mainz	Johannes Gutenberg University Mainz	ANL
0.50 pts	Josh Labounty	Kyun Woo (Chris) Hong	Eva Krageloh	Mohammad U. H. Quereshi	Mohammad U. H. Quereshi	Simon Corrodi
Subrun DQC (shifter B)	U of Kentucky	U of Michigan	UCL	ANL	U of Massachusetts	UIUC
0.50 pts	Abel Lorente Campos	Eva Krageloh	Gavin Hesketh	Peter Winter	David Kawall	Esra Barlas Yucel
Expert on call	Lorenzo Cotrozzi					

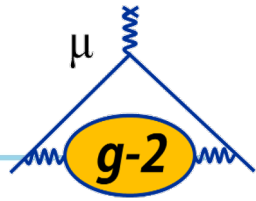
Sheet is OPEN, please

Each institution should cover 3 shifts

January					
28 Dec 2021	4 Jan 2022	11 Jan 2022	18 Jan 2022	25 Jan 2022	1 Feb 2022
FNAL	U of Mississippi	ANL	Liverpool	Liverpool	Liverpool
Hogan Nguyen	Breese Quinn	Simon Corrodi	Antony Hibbert	Antony Hibbert	Antony Hibbert
Tammy Walton	Tammy Walton	Paolo Girotti	Yuri Oksuzian	Paolo Girotti	Tammy Walton
BU	UIUC	Manchester	INFN Pisa	U of Washington	Cornell
Andy Edmons	Esra Barlas Yucel	Alex Keshavarzi	Marco Incagli	Hannah Binney	Tyler Barrett
FNAL	INFN Pisa	INFN Roma Tor Vergata and Molise	Manchester	INFN Napoli	BU
Brendan Casey	Anna Driutti	Antonio Gioiosa	Mark Lancaster	Stefano Mastroianni	Andy Edmons
			Paolo Girotti	Yuri Oksuzian	Liang Li
			U of Kentucky	ANL	U of Washington
			Laura Kelton	Peter Winter	Josh Labounty
			MSU	INFN Trieste and Udine	INFN Trieste and Udine
			Kyoko Makino	Giovanni Cantatore	Diego Cauz
			Andy Edmons	Frederick Gray	Andy Edmons

- Collaborators are signing up for shifts
- Majority of the shifters are not familiar with offline production
- Shifters consist of both junior and senior members
- Collaborators involve with the field analysis take the DQC shifts
- Detailed instructions are need
- Overview tutorial during collaboration meeting
- Shifters do not need to know any of the background details
- Shifters provide feedback

Brief Overview of Production Shifts



Muon g-2

+ Overview Activity Roadmap Issues News Wiki Repository Settings

Data Production »

Production Shifts

Table of contents

Current Information

- **Offline Shifter Calendar (Nov 2021 -)**
- **Getting Started with Production Shifts**
- **Basic Shift Information**
- **Production for Experts and Managers**
- **DQC for Experts and Managers**

Obsolete/Archived Information

- **Google Calendar: *Who is on Shift?***
- **GanttPro Production Schedule**
- **Run1 Production Shifts**

Files (0)

Data Production » Production Shifts »

New wiki page | Edit | Watch | Lock | Rename | Delete | History

Offline shifts instructions

I'm new! What do I need to do?

Table of contents

Welcome to the Muon g-2 data production shifts!

General Overview

Each shift block ranges from Tuesday to the next following Tuesday, which is bounded by the weekly offline meeting (Tuesday at 10:00 am CDT, Zoom info here)
The shifter does not work on the *next following Tuesday* but is given the option to attend the offline meeting after the shift.
The starting time is flexible and arranged between the expert-on-call and the shifter.
Shifters are highly encouraged to participate in the offline meeting at the start of the shift.
An up-to-date production status is presented at the offline meeting.
Shifters may report the activities performed and issues encountered at the offline meeting.
Shifters perform one of the three tasks which include Pre-production, Full-production, and DQC analysis.
Detailed instructions and links are presented throughout this page.
Please be patient with the expert-on-call response time.

Comments about this page or instructions are unclear?

Fill out the document **here** and let us know.

Beginning of the shift

- **Beginning** is defined according to the shifter time zone. Please check-in between 9-10 am based on the time zone.
- Feel free to contact an expert-on-call before the shift, especially if the time zone varies substantially between the expert and shifter.

1. Check-in on **#gm2pro Slack channel** and ask the managers which tasks/datasets need to be done.
2. Familiarize with the **Production Status** table
   - Search for **TODOs** under the assigned role columns.
   - After contacting the expert, perform the tasks following the wiki instructions.
   - If the task extends the shift block (e.g. full production), set the cell to **In progress**.
   - If the task encounters problems (e.g. issue found, bugfix needed, etc), set the cell to **Held**.
   - When done, set the assigned cell to **Done** and set the right adjacent cell to **TODO**.
3. If help is needed, ask experts or managers according to this table

Ending of the shift

- **Ending** is defined as the following:
  - the checklist(s) is completed for a dataset
  - the next following Tuesday corresponds to the beginning of a shift
  - instructed by the expert

1. Check-out on **#gm2pro Slack channel**
2. If preferred, report the encountered activities and issues at the weekly offline meeting. If the shifter cannot attend the meeting, please report the status to the expert.
3. If needed, report feedback regarding clarity on documentation and checklist(s). This is really appreciated.
   - See the comments section
   - If preferred, contact the managers and/or experts privately

Shifter responsibilities:

- Perform production shift procedures according to the **shift checklist(s)** for the assigned production stage.
- Report and communicate with production managers and/or other experts when problems occur.
- If needed **open a service ticket** to SCD (Scientific Computing Division) and follow up.

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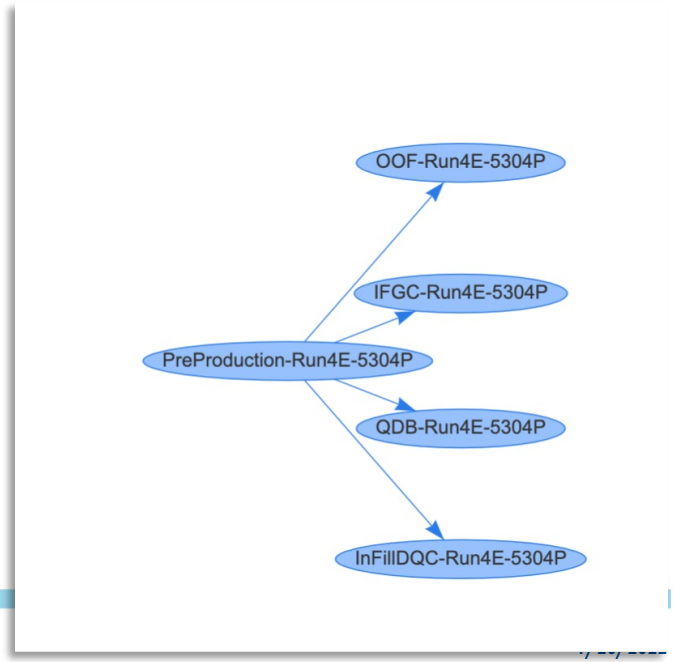
Preproduction Shifts

Dataset	Pre-staging	Pre-production	2nd stages	hadd stages
2A	Skipped	Skipped	Skipped	Skipped
2B	Done	Done	Done	Done
2C	Done	Done	Done	Done
2D	Done	Done	Done	Done
2E	Done	Done	Done	Done
2F	Done	Done	Done	Done
2G	Done	Done	Done	Done
2H	Done	Done	Done	Done
2I	Skipped	Skipped	Skipped	Skipped
3A	Skipped	Skipped	Skipped	Skipped
3B	Done	Done	Done	Done
3C	Done	Done	Done	Done
3D	Done	Done	Done	Done
3E	Done	Done	Done	Done
3F	Done	Done	Done	Done
3G	Done	Done	Done	Done
3H	Done	Done	Done	Done
3I	Done	Done	Done	Done
3J	Done	Done	Done	Done
3K	Done	Done	Done	Done
3L	Done	Done	Done	Done
3M	Done	Done	Done	Done
3N	Done	Done	Done	Done
3O	Done	Done	Done	Done
4A	Done	Done	Done	Done
4B	Done	Done	Done	Done
4C	Done	Done	Done	Done
4D	Done	Done	Done	Done
4E	Done	In progress	In progress	In progress
4F	Done	In progress	In progress	In progress
4G	Done	TODO	TODO	TODO
4H				
4I				
4J				
4K				
4L				
4M				
4N				
4O				
4P				
4Q				
4R				
4S				
4T				

- Preproduction shifts consists of multiple stages
- POMS is used for monitoring, etc
- Marc M implemented the production-shifter role
- Allows the shifter to submit jobs and change the job status



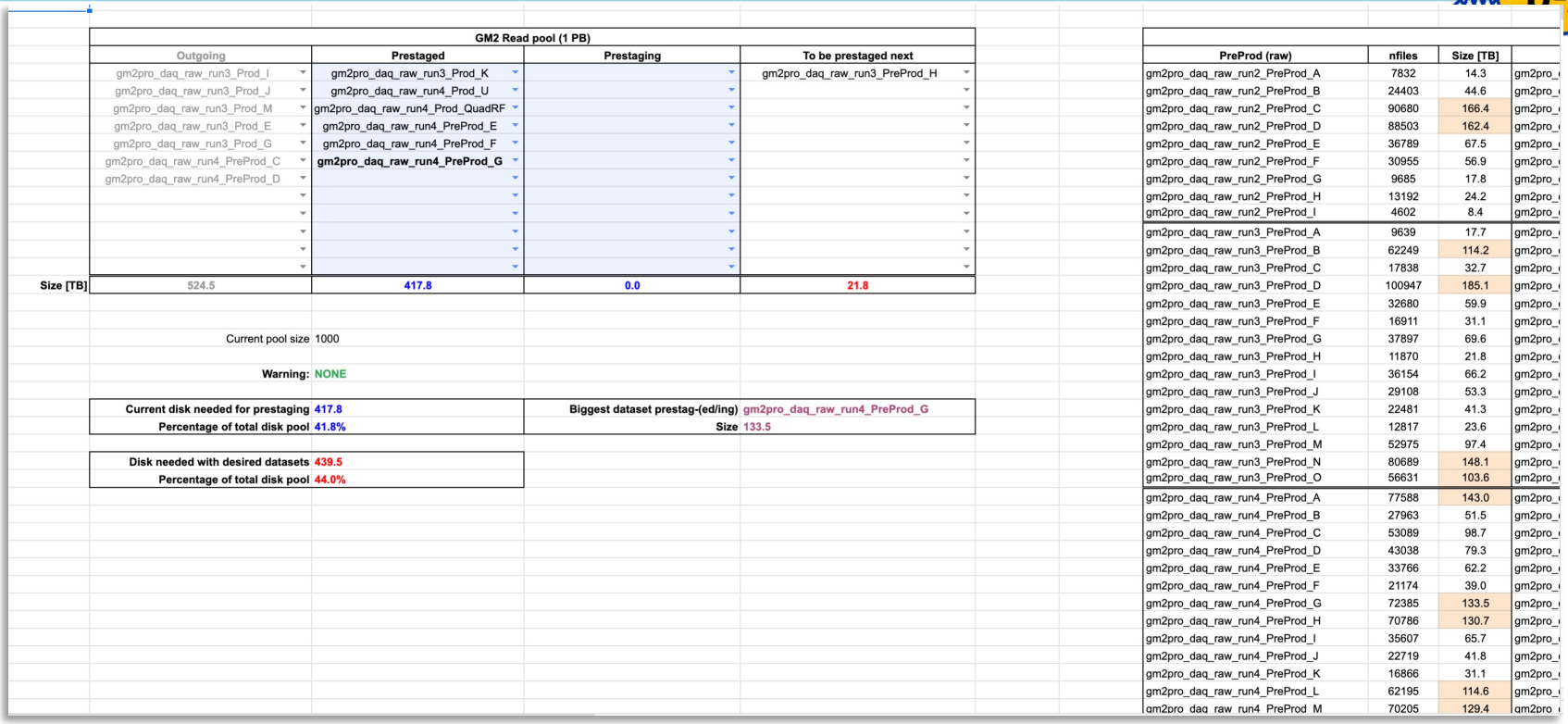
Preproduction Shifts : Prestaging

- Experts prestage the dataset

- Initially, the prestaging the data was mis-managed
  - All g-2 data reading from the 1PB GM2 pool
  - We did not keep track of the prestaging
  - Competing with ourselves

- After many discussions with Yujun and Adam, a prestaging scheme was implemented
  - Currently only Run2-4 raw data access the dedicated GM2 pool
  - All other data are directed to the general pool
  - Keep track of the prestaging
  - Prestage the data using a straggling technique

Prestaging Google Board



	GM2 Read pool (1 PB)			
	Outgoing	Prestaged	Prestaging	To be prestaged next
	gm2pro_daq_raw_run3_Prod_I	gm2pro_daq_raw_run3_Prod_K		gm2pro_daq_raw_run3_PreProd_H
	gm2pro_daq_raw_run3_Prod_J	gm2pro_daq_raw_run4_Prod_U		
	gm2pro_daq_raw_run3_Prod_M	gm2pro_daq_raw_run4_Prod_QuadRF		
	gm2pro_daq_raw_run3_Prod_E	gm2pro_daq_raw_run4_PreProd_E		
	gm2pro_daq_raw_run3_Prod_G	gm2pro_daq_raw_run4_PreProd_F		
	gm2pro_daq_raw_run4_PreProd_C	**gm2pro_daq_raw_run4_PreProd_G**		
	gm2pro_daq_raw_run4_PreProd_D			
Size [TB]	524.5	417.8	0.0	21.8

Current pool size 1000

Warning: NONE

Current disk needed for prestaging	417.8
Percentage of total disk pool	41.8%

Disk needed with desired datasets	439.5
Percentage of total disk pool	44.0%

Biggest dataset prestag-(ed/ing)	gm2pro_daq_raw_run4_PreProd_G
Size	133.5

PreProd (raw)	nfiles	Size [TB]	
gm2pro_daq_raw_run2_PreProd_A	7832	14.3	gm2pro_
gm2pro_daq_raw_run2_PreProd_B	24403	44.6	gm2pro_
gm2pro_daq_raw_run2_PreProd_C	90680	166.4	gm2pro_
gm2pro_daq_raw_run2_PreProd_D	88503	162.4	gm2pro_
gm2pro_daq_raw_run2_PreProd_E	36789	67.5	gm2pro_
gm2pro_daq_raw_run2_PreProd_F	30955	56.9	gm2pro_
gm2pro_daq_raw_run2_PreProd_G	9685	17.8	gm2pro_
gm2pro_daq_raw_run2_PreProd_H	13192	24.2	gm2pro_
gm2pro_daq_raw_run2_PreProd_I	4602	8.4	gm2pro_
gm2pro_daq_raw_run3_PreProd_A	9639	17.7	gm2pro_
gm2pro_daq_raw_run3_PreProd_B	62249	114.2	gm2pro_
gm2pro_daq_raw_run3_PreProd_C	17838	32.7	gm2pro_
gm2pro_daq_raw_run3_PreProd_D	100947	185.1	gm2pro_
gm2pro_daq_raw_run3_PreProd_E	32680	59.9	gm2pro_
gm2pro_daq_raw_run3_PreProd_F	16911	31.1	gm2pro_
gm2pro_daq_raw_run3_PreProd_G	37897	69.6	gm2pro_
gm2pro_daq_raw_run3_PreProd_H	11870	21.8	gm2pro_
gm2pro_daq_raw_run3_PreProd_I	36154	66.2	gm2pro_
gm2pro_daq_raw_run3_PreProd_J	29108	53.3	gm2pro_
gm2pro_daq_raw_run3_PreProd_K	22481	41.3	gm2pro_
gm2pro_daq_raw_run3_PreProd_L	12817	23.6	gm2pro_
gm2pro_daq_raw_run3_PreProd_M	52975	97.4	gm2pro_
gm2pro_daq_raw_run3_PreProd_N	80689	148.1	gm2pro_
gm2pro_daq_raw_run3_PreProd_O	56631	103.6	gm2pro_
gm2pro_daq_raw_run4_PreProd_A	77588	143.0	gm2pro_
gm2pro_daq_raw_run4_PreProd_B	27963	51.5	gm2pro_
gm2pro_daq_raw_run4_PreProd_C	53089	98.7	gm2pro_
gm2pro_daq_raw_run4_PreProd_D	43038	79.3	gm2pro_
gm2pro_daq_raw_run4_PreProd_E	33766	62.2	gm2pro_
gm2pro_daq_raw_run4_PreProd_F	21174	39.0	gm2pro_
gm2pro_daq_raw_run4_PreProd_G	72385	133.5	gm2pro_
gm2pro_daq_raw_run4_PreProd_H	70786	130.7	gm2pro_
gm2pro_daq_raw_run4_PreProd_I	35607	65.7	gm2pro_
gm2pro_daq_raw_run4_PreProd_J	22719	41.8	gm2pro_
gm2pro_daq_raw_run4_PreProd_K	16866	31.1	gm2pro_
gm2pro_daq_raw_run4_PreProd_L	62195	114.6	gm2pro_
gm2pro_daq_raw_run4_PreProd_M	70205	129.4	gm2pro_

- There is a cronjob use to prestage the raw datasets bi-weekly
- Datasets under the “Prestaged” column are prestaged bi-weekly
- Datasets under the “Outgoing” column are removed from the cronjob
- The official/final production datasets are prestaged monthly
- Users are allowed to prestage any datasets < 300TB
- Users must submit a request to prestage datasets > 300TB or any of the run2-4 raw datasets

Preproduction Shifts

Dataset	Pre-staging	Pre-production	2nd stages	hadd stages
2A	Skipped	Skipped	Skipped	Skipped
2B	Done	Done	Done	Done
2C	Done	Done	Done	Done
2D	Done	Done	Done	D
2E	Done	Done	Done	D
2F	Done	Done	Done	D
2G	Done	Done	Done	D
2H	Done	Done	Done	D
2I	Skipped	Skipped	Skipped	Sk
3A	Skipped	Skipped	Skipped	Sk
3B	Done	Done	Done	D
3C	Done	Done	Done	D
3D	Done	Done	Done	D
3E	Done	Done	Done	D
3F	Done	Done	Done	D
3G	Done	Done	Done	D
3H	Done	Done	Done	D
3I	Done	Done	Done	D
3J	Done	Done	Done	D
3K	Done	Done	Done	D
3L	Done	Done	Done	D
3M	Done	Done	Done	D
3N	Done	Done	Done	D
3O	Done	Done	Done	Done
4A	Done	Done	Done	Done
4B	Done	Done	Done	Done
4C	Done	Done	Done	Done
4D	Done	Done	Done	Done
4E	Done	In progress	In progress	In progress
4F	Done	In progress	In progress	In progress
4G	Done	TODO	TODO	TODO
4H				
4I				
4J				
4K				
4L				
4M				
4N				
4O				
4P				
4Q				
4R				
4S				
4T				

Pre Production Checklist

Table of contents

Pre Production Checklist
- Offline Preproduction Start of Checklist
- Offline Production Monitoring 8-hour Checklist
- Offline Preproduction PreEnd of Checklist
- Offline Preproduction End of Checklist

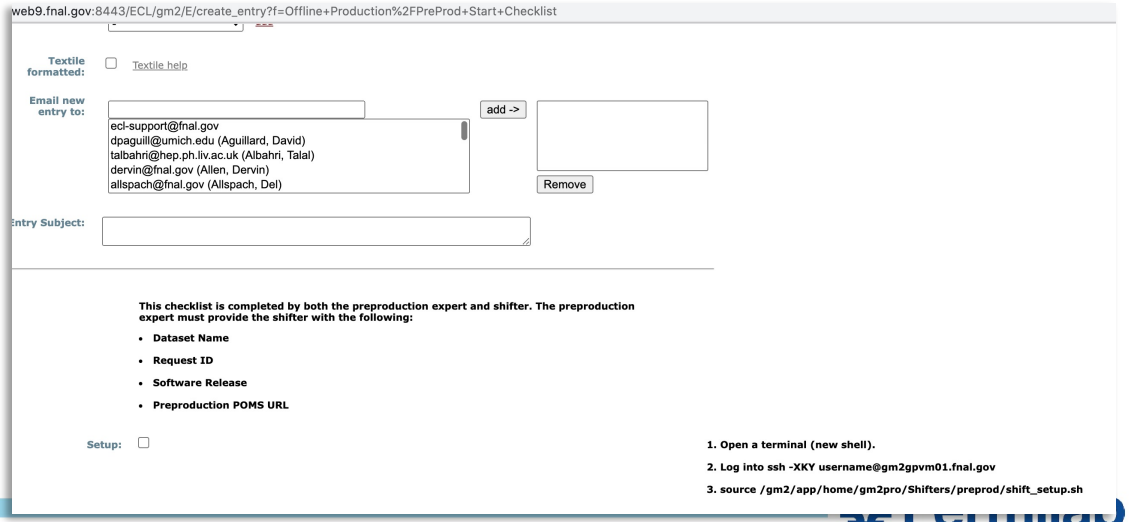
Please see Getting Started with Production Shifts before proceeding with the checklists.

Offline Preproduction Start of Checklist

Offline Production Monitoring 8-hour Checklist

Offline Preproduction PreEnd of Checklist

Offline Preproduction End of Checklist



Preproduction Shifts : Snapshot of Checklist

Start of Checklist

For monitoring the offline preproduction shifts, you need to be able to login g-2 virtual machines and open the POMS shifter webpage

- **Please remember to submit the e-log, Offline Production/PreProd Start Checklist**

Q0. Setup

Setup environment on g-2 virtual machines.

1. Open a terminal (new shell).
2. Log into gpvms: ssh -XKY username@gm2gpvm01.fnal.gov
3. source /gm2/app/home/gm2pro/Shifters/preprod/shift_setup.sh

Q1. Dataset Name

- What is the name of the preproduction dataset? Provided by the expert or manager.

Q2. Run Period

- What run period does the dataset belong to? The period is in the dataset name.

Q3. Request ID and Release Version

- What is the processing request id and software release version? Provided by the expert or manager.

Q4. Prestage

- Confirm that the dataset is pre-stage by following the instructions below. [Confirmation takes about 20 to 30 minutes.]

1. Return to your terminal
2. ./samlocate.sh -p <name of dataset>
   PRESTAGE EXAMPLE

```
./samlocate.sh -p gm2pro_daq_raw_run2_PreProd_D
Locating files from dataset(s): gm2pro_daq_raw_run2_PreProd_D ...
Progess [==========================================================] 100%: 88503/88503 done and 0 to go...

Processing 88503 files in total...
Progess [==========================================================] 100%: 88503/88503 done and 0 to go...
Finished checking prestage status for 88503 files, 88503 (~100%) are staged.
```

NOT PRESTAGE EXAMPLE

```
Locating files from dataset(s): gm2pro_daq_raw_run2_PreProd_F ...
Progess [==========================================================] 100%: 30955/30955 done and 0 to go...

Progess [==========================================================] 100%: 30955/30955 done and 0 to go...

Finished checking prestage status for 30955 files, 1555 (~5%) are staged.
```

3. A non-prestage dataset's status is less than 90%.
   - If a dataset is more than 99% prestage, continue with the checklist.
   - If the prestaging falls between 90-99%, contact the expert on how to proceed.
   - If a dataset is less than 90% prestage, ask the expert to prestage the dataset.
   - **Prestaging Instructions for the expert**
     1. Log into gpvm as gm2pro.
        1. screen
        2. samweb -e gm2 prestage-dataset --defname=<name of dataset> --parallel=25
        3. detach from screen
        4. **DO NOT PROCEED** with checklist until prestaging is a success.
     2. Each day check if the dataset is prestage. Go to the wiki page: https://samweb.fnal.gov:8483/station_monitor/gm2/stations/gm2/
        - The name of your project is **prestage_gm2pro_<name of dataset>_<date>**
        - If the **Files in snapshot** equals **Files Seen**, then the dataset is prestage. Continue with checklist.

Q5. File Family

- Confirm that the file family system is setup

1. Go to terminal.
2. cd /pnfs/GM2/daq/${RUN_PERIOD}/offline/gm2_${REQUEST_ID}
   - <run period>: see Q2
   - <request id>: see Q3
3. enstore sfs --tags
   - the screen should display : .(tag)(file_family) = gm2_${REQUEST_ID}
     REFERENCE

```
[gm2pro@gm2gpvm04:/pnfs/GM2/daq/run4/offline/gm2_5301P]> enstore sfs --tags
.(tag)(file_family) = gm2_5301P
.(tag)(file_family_width) = 2
.(tag)(file_family_wrapper) = cpio_odc
.(tag)(library) = CD-LTO8G2
.(tag)(OSMTemplate) = StoreName sql
.(tag)(sGroup) = chimera
.(tag)(storage_group) = GM2
```

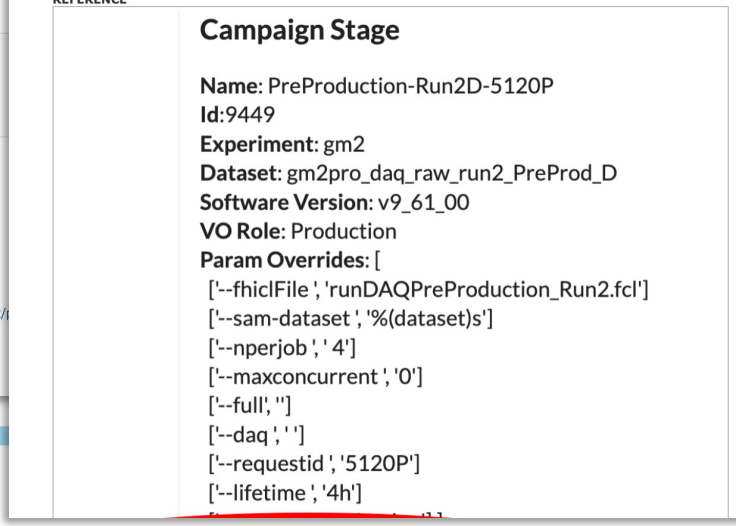
- If no, please contact the pre-production expert and **STOP**

Q6. POMS Campaign

- Open the Preproduction POMS campaign URL. The link is provided by the preproduction expert.

Q7. POMS Split Type

1. On the primary POMS page, scroll to the **Campaign Stage** panel
2. Confirm **Split Type** is defined as **nfiles(5000)**. If not, contact the preproduction expert.
   REFERENCE



Campaign Stage

Name: PreProduction-Run2D-5120P
Id:9449
Experiment: gm2
Dataset: gm2pro_daq_raw_run2_PreProd_D
Software Version: v9_61_00
VO Role: Production
Param Overrides: [
['--fhiclFile ', 'runDAQPreProduction_Run2.fcl']
['--sam-dataset ', '%(dataset)s']
['--nperjob ', ' 4']
['--maxconcurrent ', '0']
['--full', '']
['--daq ', ' ']
['--requestid ', '5120P']
['--lifetime ', '4h']

Production Monitoring

- https://cdcvs.fnal.gov/redmine/projects/g-2/wiki/Offline_Production_Monitoring_8-hour_Checklist

Table of contents

Q5. POMS Recent Launch Outputs

1. Scroll to the **Recent Launch Outputs** panel.
2. Click on the **green info** button for **each active** launch within last **24 hours**.
   - You are directed to the **Submission Details** page corresponding to the selected launch.
   - If there are **NOT** any active launches, go to **Q7**
3. Go to the **History** panel
   - The **History** panel shows the evolution of the job state for the selected launch.
   - The types of status are: **New**, **Idle**, **Running**, **Held**, **Completed**, **(Launch) Failed**, **Removed**, **Skipped**, and **Located**.
4. Confirm that the launch is **active**.
   - Inactive includes a **Located** (all files have been copied to the default /pnfs/GM2/scratch and transferred to tape) or **Removed** status
     - If an inactive launch changes to **New** or **Idle** status while monitoring, contact expert on how to proceed.
     - Be prepared to kill the launch (**blue trash can**)
5. Confirm that there are no **errors**
   - **Errors** include **Skipped**, **Failed** and **Empty History Panel**
     - Follow the instructions below for an **Empty History Panel** or **Failed/Skipped** status
6. Confirm that the launch is **running**
   - If the latest status is **Completed**, **Idle**, or **New**, follow the instructions below for **Completed**, **Idle**, or **New**
   - No action is required for the following: **Running** or **Held**

Below are additional instructions for each above step

- **Empty History Panel** Instructions
  1. Go to the **Submission fields** panel.
  2. Check the **created** parameter to find out when the job was submitted.
     - No action is required if the time difference between your clock and the **created parameter** is less than 2 hours.
     - If the time difference is more than 2 hours, then
       1. Alert expert with a direct link to the info page (**Submission Details**).
       2. Open a terminal and ping **gm2gpvm03.fnal.gov**.
       3. If **gm2gpvm03.fnal.gov** is NOT responding, open a service ticket to **Scientific Server Infrastructure Services**.
          - Click on [**Report an Issue**] and then [**High**] in "How quickly does this need to be resolved?", add the expert's name(s) in the ticket watch list, and record the ticket number.
          - Make a note in the **Additional Comments** section of the e-log.

- **(Launch) Failed/Skipped** Status Instructions
  - ***Full Production shifters***
    - Click on "View launch output" and check for any errors in the launch output.
      - If there is an error or unusual output, alert an expert with a direct link to the launch output.
      - In case of **END OF DATASET EXAMPLE ERROR** below, check the remaining dataset size following **Q3**.
      - If the remaining dataset size > 0, reset the counter and relaunch the job submission as described in **Q3**, notify expert.
      - For all other cases, follow **Bumping Submission Status** instructions below.
  - ***Pre and Full Production shifters***
    - Follow the **Bumping Submission Status** instructions below.
    - Make a note in the **Additional Comments** section of the e-log.

- **Completed**, **Idle**, or **New** Status Instructions
  - **Completed**: If the time difference between your clock and the timestamp is more than **6 hours**, follow the **Bumping Submission Status** instructions.
  - **Idle or New**: If the time difference between your clock and the timestamp is more than **6 hours**, follow the instructions below.
    - Click on "View launch output" and check for any errors in the launch output.
      - If there is no "View launch output" link, notify expert.
    - If an error appears (see below for example), notify expert and return to the **Submission Detail** page.
      - Go to the **Actions** panel.
      - Kill the job by clicking on **Kill Condor Jobs** (**blue trash can**).
      - Click **Yes, kill them** on the directed page (see below for example).
      - Make a note in the **Additional Comments** section of the e-log.
    - If there is no error or unusual launch output but the submission has being in **Idle or New** status for more than **6 hours**, alert expert with a direct link to the **Submission Detail** page.
      - Be prepared to kill the job and then click on **Relaunch** button if requested by expert.
  - **END OF DATASET EXAMPLE ERROR**
  - This happens when there are not any files in the remaining dataset.

```
Processing dataset name:
gm2pro_daq_raw_run3_Prod_B_5218A_slice1_files5000 ...


!!!SAM dataset 'gm2pro_daq_raw_run3_Prod_B_5218A_slice1_files5000' seems
empty!!!
```

Production Monitoring

- https://cdcvs.fnal.gov/redmine/projects/g-2/wiki/Offline_Production_Monitoring_8-hour_Checklist

Table of contents

Offline Production Monitoring 8-hour Checklist

- Q0. Production Type
- Q1. Dataset Name
- Q2. POMS Last Split Value
- Q3. POMS Active Job Status
- Q4. POMS Recent Launch History
- Q5. POMS Recent Launch Outputs
- Q6. POMS Earliest Launch
- Q7. POMS Report/Status (Overview)
- Q8. Test Dataset
- Q9. SAM Project
- Q10. POMS Dependencies
- Q11. Dependencies Jobs Completed
- Q12. Recovery Jobs
- Q13. Batch Job
- Q14. FTS
- Q15. Transfer Rate
- Q16. Dache Persistent Usage
- Q17. FIFE Batch Details
- Q18. Experiment Batch Details

in Campaign run_v9_44_00_Production 4442

Information

Submission was: a regular launch

View in Landscape
View the SAM Project
View the Job Logs

REFERENCE

Project gm2pro_2021120111_19107

Generated at 2021-12-01 19:33:32

Project Id	759089
Status	ended complete
Owner	gm2pro
Start time	2021-12-01 11:12:43
Dataset definition	poms_recover_1071765_1
Snapshot Id	396405
Files in snapshot	19
Files seen	19
Processes	19
Busy processes	0
Finished processes	19
Waiting processes	0
Error processes	0
Cancelled processes	0
Median wait time (per file)	2min 1s
Median transfer time (per file)	2min 27s
Median busy time (per file)	14min 32s
Last activity	project ended at 2021-12-01 11:45:12

Production Monitoring

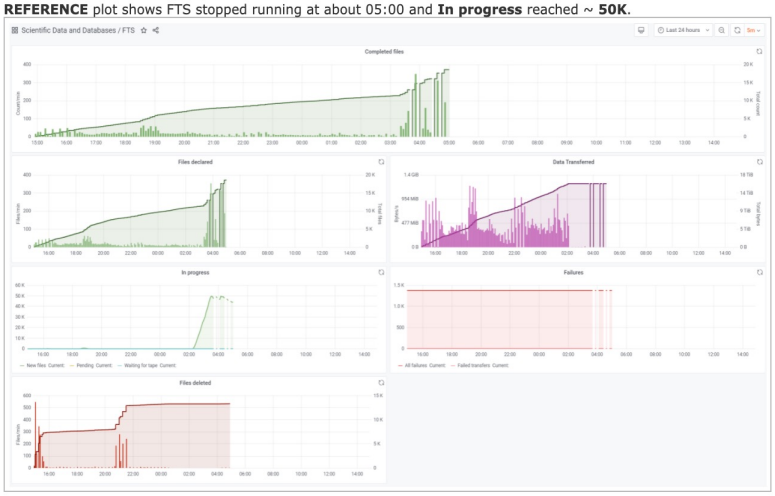
- https://cdcvs.fnal.gov/redmine/projects/g-2/wiki/Offline_Production_Monitoring_8-hour_Checklist

Table of contents

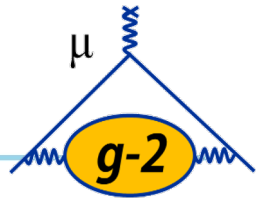
Q14. FTS

1. On **Sandbox / Production Shifter - GM2** page, check the number of **Pending Current** and **Waiting on Tape Current**.
   - If the number of pending > 50K or waiting > 10K, confirm that the **Offline FTS** has not stopped as shown in the **REFERENCE**.
2. Go to the **FIFE Offline FTS monitoring page** and check the **In progress** graph.
   - If the number of **In progress** > 10K for more than **6 hours**, follow the instructions below
     - Confirm that **Offline FTS** has not stopped as shown in the **REFERENCE**.
     - Confirm that waiting or pending files are not due to the **Offline FTS**.
   - If **FTS** has stopped, contact expert immediately to restart **FTS**.
     - **Until FTS is back online and resumes running status, do NOT submit any new production jobs (including auto launches and/or recovery jobs).**
     - **If new jobs are launched when FTS is down, kill those jobs.**
   - If **FTS** has not stopped and there are many files **In progress** (> 10K) for more than **6 hours**:
     - Alert an expert on the **gm2pro SLACK channel** with a screenshot of **FTS** status.
     - Request expert to check **PoolManager** status.
     - If instructed, **Open an FTS Service Ticket** describing the issue (use screenshot if necessary), add the expert's name(s) in the ticket watch list, and record the ticket number in the **Additional Comments** section of the e-log.
     - **Until the number of In progress goes down to ~ 0, do NOT submit any new production jobs (including auto launches and/or recovery jobs).**
     - **If new jobs are launched when the number of In progress > 10K, kill those jobs.**
3. Check **Online FTS monitoring page** following Online FTS instructions, notify **gm2shifter_channel** if there is any problem.
4. Post offline FTS screenshot in the Elog **IF** both the primary and secondary campaigns are completed.

REFERENCE plot shows FTS stopped running at about 05:00 and **In progress** reached ~ **50K**.



Outline



- Motivation
- Overview of Production Workflow
- Production Shifts
  - Preproduction
  - Constants Analysis
  - Full Production
  - Data Quality
- Performance
- Summary

Constants Analysis

- When the preproduction is completed, the shifter notifies the constants team and updates the google spreadsheet and wiki
- The constants expert analyses and extracts the constants
- When the constants are completed, the expert updates the google spreadsheet and wiki

Constants analysis (experts)						
IFG	OOF	QMethod	Laser DQC	Kicker DQC	T0 DQC	Channel status
Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	In progress	Done	Done
Done	Done	Done	Done	In progress	TODO	Done
Done	Done	Done	Done	In progress	TODO	Done

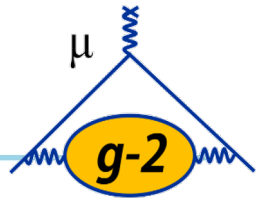
Raw Datasets

These datasets used for the first stage of the pre-production. The datasets consist of the midas files and are defined by the run range and having more than one event.

Start Run	End Run	Dataset Name	nFiles	T0 DQC	Kicker DQC	Laser DQC	IBMS PreProd	IFG plots	OOF plots
30051	30099	gm2pro_daq_raw_run3_PreProd_A	9639	T0 3A	Kicker 3A	Laser 3A	IBMS 3A PreProd	IFG 3A	OOF 3A
30252	30506	gm2pro_daq_raw_run3_PreProd_B	62249	T0 3B	Kicker 3B	Laser 3B	IBMS 3B PreProd	IFG 3B	OOF 3B
30949	31063	gm2pro_daq_raw_run3_PreProd_C	17838	T0 3C	Kicker 3C	Laser 3C	IBMS 3C PreProd	IFG 3C	OOF 3C
31368	32035	gm2pro_daq_raw_run3_PreProd_D	100947	T0 3D	Kicker 3D	Laser 3D		IFG 3D	OOF 3D
32126	32319	gm2pro_daq_raw_run3_PreProd_E	32680	T0 3E	Kicker 3E	Laser 3E		IFG 3E	OOF 3E
32404	32465	gm2pro_daq_raw_run3_PreProd_F	16911	T0 3F	Kicker 3F	Laser 3F		IFG 3F	OOF 3F
32608	32776	gm2pro_daq_raw_run3_PreProd_G	37897	T0 3G	Kicker 3G	Laser 3G		IFG 3G	OOF 3G
32985	33082	gm2pro_daq_raw_run3_PreProd_H	11870	T0 3H	Kicker 3H	Laser 3H		IFG 3H	OOF 3H
33119	33275	gm2pro_daq_raw_run3_PreProd_I	36154	T0 3I	Kicker 3I	Laser 3I		IFG 3I	OOF 3I
33320	33521	gm2pro_daq_raw_run3_PreProd_J	29108	T0 3J	Kicker 3J	Laser 3J		IFG 3J	OOF 3J
33580	33663	gm2pro_daq_raw_run3_PreProd_K	22481	T0 3K	Kicker 3K	Laser 3K		IFG 3K	OOF 3K
33704	33743	gm2pro_daq_raw_run3_PreProd_L	12817	T0 3L	Kicker 3L	Laser 3L		IFG 3L	OOF 3L
33841	34139	gm2pro_daq_raw_run3_PreProd_M	52975	T0 3M	Kicker 3M	Laser 3M		IFG 3M	OOF 3M
34184	34619	gm2pro_daq_raw_run3_PreProd_N	80689	T0 3N	Kicker 3N	Laser 3N	IBMS 3N PreProd	IFG 3N	OOF 3N
34702	34922	gm2pro_daq_raw_run3_PreProd_O	56631	T0 3O	Kicker 3O	Laser 3O	IBMS 3O PreProd	IFG 3O	OOF 3O

Links to analysis and validation plots

Outline



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- Production Shifts
  - Preproduction
  - Constants Analysis
  - Full Production
  - Data Quality
- Performance
- Summary

Full Production Shifts

M	N	O	P	Q	R	S
Pre-staging	Full production (test)	DQC (test)	Full production	Recovery	Subrun DQC	Dataset delivered
Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Skipped	Skipped	Skipped	Skipped	Skipped	Skipped	Skipped
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	TODO
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done
Done	Done	Done	Done	Done	Done	Done

Full production shifts are similar to preproduction shifts

However, the data are processed via the full reconstruction

To mitigate human error, first a test production is completed

Consists of about 5000 files that are selected randomly in a dataset

When the test full production is completed, the fully reconstructed dataset is passed to the DQC analysis

Full Production Checklist

Table of contents

Full Production Checklist
- Offline Full Production Start Of Dataset Checklist
- Offline Full Production Test Dataset Checklist
- Offline Production Monitoring 8-hour Checklist
- Offline Full Production End Of Dataset Checklist

Please see Getting Started with Production Shifts before proceeding with the checklists.

Offline Full Production Start Of Dataset Checklist

Offline Full Production Test Dataset Checklist

Offline Production Monitoring 8-hour Checklist

Offline Full Production End Of Dataset Checklist

Full Production Shifts

Campaign Stage

Name: FullProduction-Run4QuadRF-5304A
Id:12908
Experiment: gm2
Dataset: gm2pro_daq_raw_run4_Prod_QuadRF_test_5304A
Software Version: v9_72_00
VO Role: Production
Param Overrides: [
['--sam-dataset ', '%(dataset)s']
['--fhiclFile ', 'gm2offline_unpacking.fcl,gm2offline_calorecoWDQC.fcl,gm2offline_trackreco.fcl,gm2offline_Qcaloreco.fcl']
['--unpack', '']
['--daq', '']
['--requestid ', '5304A']
['--nperjob ', '2']
['--process ', 'offline']
['--memory ', '4000']
['--lifetime ', '12h']
['--disk ', '30']]
Split Type: draining(5000)
Last Split: 425386 ⏮ Reset
Created: 2022-01-18 03:11:44.108125-06:00
Creator: pgirotti
Updated: 2022-01-18 05:31:46.581350-06:00
Updater: pgirotti

Requiring 4GB is recently
Finding a solution such only 2GB is needed

Preproduction uses static datasets
Full production uses draining datasets

Draining datasets are easier to manage when recovery is needed
Shifters only need to reset the process

SAM is growing
When full production encounters timeout issues, the job switches to static datasets

Outline

- Motivation
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Data Quality Shifts

- DQC shifters work about a total of 8 hours the entire block
- The shift requirements have changed since the initial implementation
- Shifters do not used POMS
- A set of python and bash scripts are used
- Shifters used command line to navigate a dataset through the DQC analysis machinery
- Makes it easier to attract senior members to sign up for shifts

Data Quality Shifts

- Detailed instructions are provided
  - https://cdcvs.fnal.gov/redmine/projects/g-2/wiki/Data_Quality_Checklist

- DQC shifters work much more closely with the experts
  - Requires defining cuts and updating metadata

The shifter is responsible for navigating the test or full production dataset thru the DQC analysis machinery, which includes two separate components.

- **calorimeter gain validation analysis [Q1]**
  - The endgame is to produce and evaluate the standard gain calibration plots.
  - This procedure is performed using POMS and local machines.
- **data quality analysis [Q2 thru Q9]**
  - The endgame is to produce and evaluate the standard data quality plots.
  - This procedure requires converting histograms to constants, which are stored in a PostgresSQL online database located on a stand-alone machine at MC-1.
  - Therefore, the shifter is performing steps consisting of file handling and generating plots.

Certain parts of the checklist require some analysis, which is performed with the expert-on-call or DQC manager.

Q0. Prepare for the Checklist

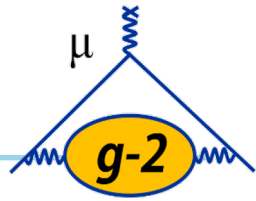
The shifter requirements:

- Log into all of the gm2gpvms [gm2gpvm0X.fnal.gov, where X=1,2,3,4].
- Open a tunnel into G2Muon@g2gateway01.fnal.gov backend machine.
  - Permissions daq@g2db.fnal.gov
- Check in the **gm2pro SLACK channel** and wait for instructions from expert-on-call

The expert-on-call will provide the following information:

- **Dataset name**
- **Dataset request id**
- **POMS campaign URL** to monitor
- **Working schedule**

Outline



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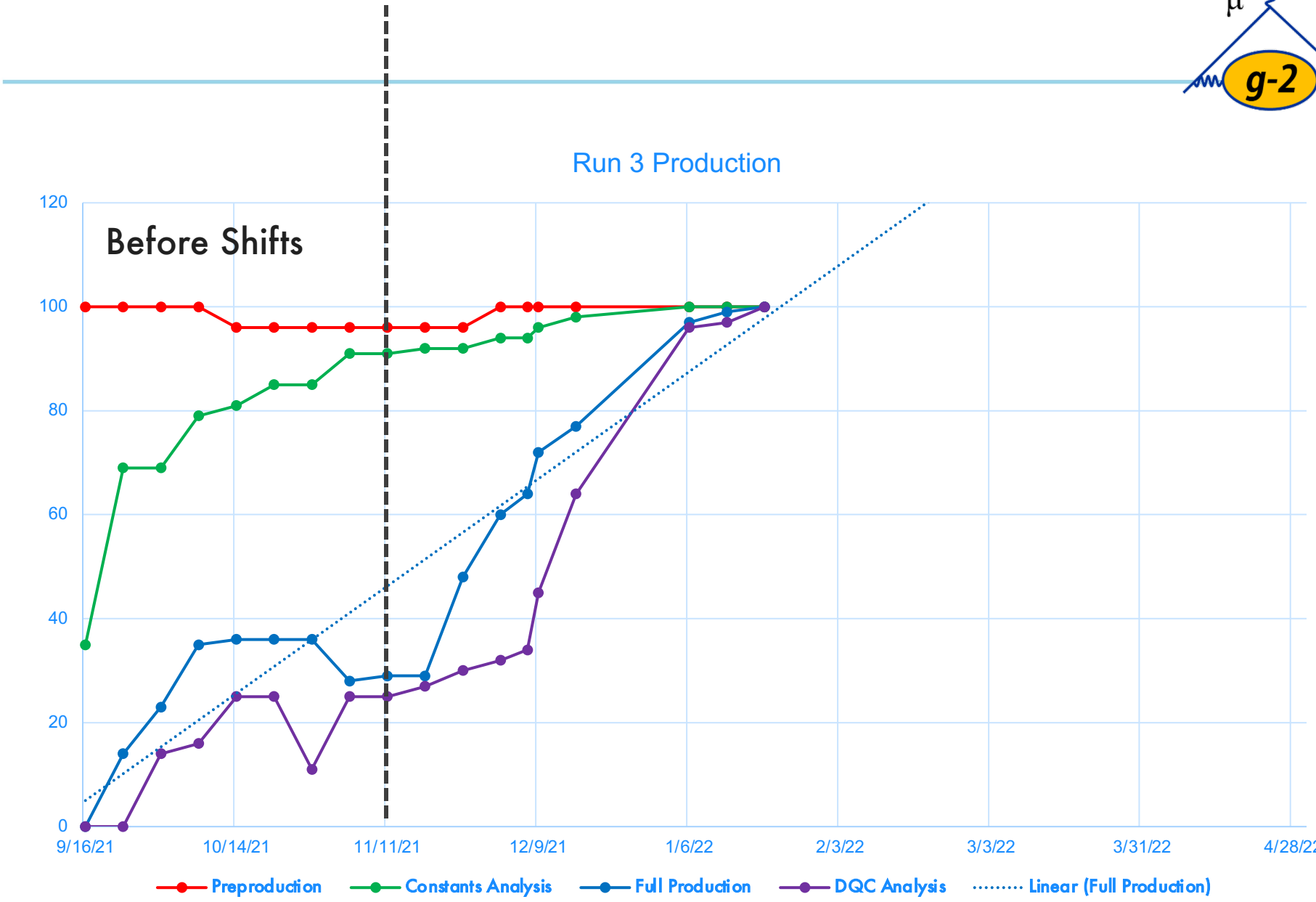
Elog Collection

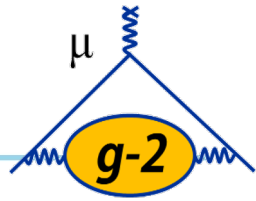
106691	12/23/2021	**Offline shift**	**[hogann]**	Offline Production/8-hour Checklist
106687	12/23/2021	**Offline shift**	**[jmott]**	Offline Production/8-hour Checklist *3M: Full Productio*
106654	12/23/2021	**Offline shift**	**[jmott]**	Offline Production/Full Prod End Checklist *Run 3L: Full*
106647	12/23/2021	**Offline shift**	**[hogann]**	Offline Production/8-hour Checklist
106597	12/22/2021			
106566	12/22/2021			
106545	12/22/2021			
106492	12/21/2021			
106486	12/21/2021			
106475	12/21/2021			
106474	12/21/2021			
106473	12/21/2021			
106472	12/21/2021			
106470	12/21/2021			
106466	12/21/2021			
106461	12/21/2021			
106458	12/21/2021			
106453	12/21/2021			
106452	12/21/2021			
106419	12/21/2021			
106411	12/20/2021			
106409	12/20/2021			
106407	12/20/2021			
106370	12/20/2021			

106240	12/18/2021	**Offline shift**	**[bmaccoy]**	Offline Production/8-hour Checklist
106210	12/18/2021	**Offline shift**	**[bmaccoy]**	Offline Production/8-hour Checklist
106173	12/18/2021	**Offline shift**	**[bmaccoy]**	*Offline FTS looks like it stopped* Offline FTS appears to be
106172	12/18/2021	**Offline shift**	**[bmaccoy]**	*Offline FTS looks like it stopped* Offline FTS appears to be
106170	12/18/2021	**Offline shift**	**[bmaccoy]**	Offline Production/8-hour Checklist
106129	12/17/2021	**Offline shift**	**[bmaccoy]**	
106117	12/17/2021	**Offline shift**	**[rfatemi]**	
106116	12/17/2021	**Offline shift**	**[bmaccoy]**	
106098	12/16/2021	**Offline shift**	**[bmaccoy]**	
106095	12/16/2021	**Offline shift**	**[rfatemi]**	
106094	12/16/2021	**Offline shift**	**[rfatemi]**	
106093	12/16/2021	**Offline shift**	**[rfatemi]**	
106092	12/16/2021	**Offline shift**	**[rfatemi]**	
106091	12/16/2021	**Offline shift**	**[rfatemi]**	
106090	12/16/2021	**Offline shift**	**[rfatemi]**	
106089	12/16/2021	**Offline shift**	**[rfatemi]**	
106078	12/16/2021	**Offline shift**	**[jmott]**	
106065	12/16/2021	**Offline shift**	**[bmaccoy]**	
106044	12/16/2021	**Offline shift**	**[bmaccoy]**	
106024	12/15/2021	**Offline shift**	**[bmaccoy]**	
106023	12/15/2021	**Offline shift**	**[bmaccoy]**	
105992	12/15/2021	**Offline shift**	**[jmott]**	
105976	12/14/2021	**Offline shift**	**[bmaccoy]**	

104058	11/23/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
104050	11/23/2021	**Offline shift**	**[rreimann]**	Offline Production/8-hour Checklist *Checklist done, D*
104015	11/22/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
104007	11/22/2021	**Offline shift**	**[rreimann]**	Offline Production/8-hour Checklist
103996	11/22/2021	**Offline shift**	**[labounty]**	Offline Production/DQC Checklist *DQC Checklist: 3D*
103995	11/22/2021	**Offline shift**	**[labounty]**	Offline Production/DQC Checklist *DQC Checklist: 3D*
103992	11/22/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
103962	11/22/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
103929	11/21/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
103913	11/21/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
103883	11/21/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
103862	11/20/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
103757	11/19/2021	**Offline shift**	**[pgirotti]**	Offline Production/PreProd Start Checklist *Start of prep*
103745	11/19/2021	**Offline shift**	**[labounty]**	Offline Production/DQC Checklist *DQC Checklist: 3D*
103744	11/19/2021	**Offline shift**	**[labounty]**	Offline Production/DQC Checklist *Run 3B DQC Checkl*
103732	11/19/2021	**Offline shift**	**[dominika]**	Offline Production/Full Prod Test Checklist
103731	11/19/2021	**Offline shift**	**[rreimann]**	Offline Production/Full Prod Test Checklist
103647	11/18/2021	**Offline shift**	**[rreimann]**	Offline Production/8-hour Checklist
103601	11/18/2021	**Offline shift**	**[rreimann]**	Offline Production/8-hour Checklist
103588	11/18/2021	**Offline shift**	**[rreimann]**	Offline Production/8-hour Checklist
103534	11/17/2021	**Offline shift**	**[rreimann]**	Offline Production/8-hour Checklist
103505	11/17/2021	**Offline shift**	**[dominika]**	Offline Production/8-hour Checklist
103496	11/17/2021	**Offline shift**	**[rreimann]**	Offline Production/8-hour Checklist


Run 3 Production
Before Shifts
120
100
80
60
40
20
0
9/16/21
10/14/21
11/11/21
12/9/21
1/6/22
2/3/22
3/3/22
3/31/22
4/28/22
Preproduction
Constants Analysis
Full Production
DQC Analysis
Linear (Full Production)

Outline



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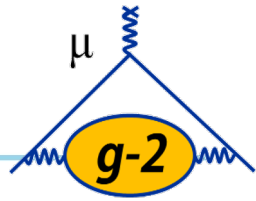

- Overall positive feedback
- Received critical feedback for improvements especially for beginners
- Introducing many of the FIFE landscape and POMS tools to the collaboration
- Helping developers and analyzers improve their production workflow
- Opportunity for the collaboration to view the experiment from a different perspective
- Provide a relaxing space for early-career or first timers to give a talk
- Goal is to need only one shifter per production stage
- Workload has been reduced significantly for offline and production managers
- Most importantly, faster production turnaround