

# Discussione necessità di calcolo

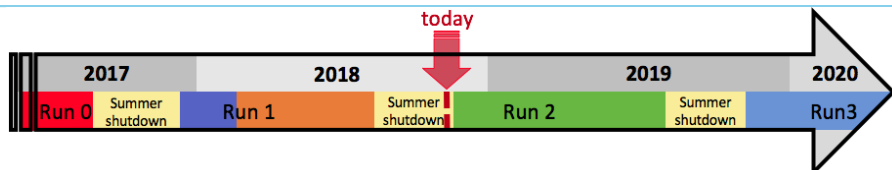
A. Driutti

Riunione g-2 con i referee

Friday, 7 September 2018



# Muon g - 2 Timeline

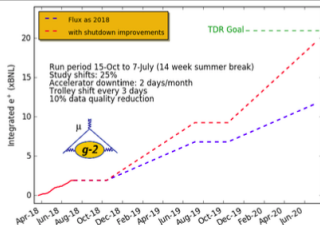
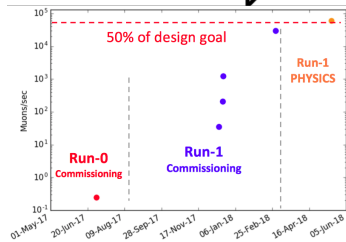


**Run 0** : commissioning run with 1-4 fills/min and beam dominated by protons.

**Run 1** : commissioning + physics run achieved 50% of design flux and recorded  **$2 \times \text{BNL stat.}$**

**Run 2** : summer shutdown work to increase muon flux by a factor of 1.5  $\Rightarrow$  expect to reach  **$10 \times \text{BNL stat.}$**  by summer 2019

**Run 3** : increase muon flux by an additional factor of 1.4 during the summer shutdown  $\Rightarrow$  expect to reach  **$20 \times \text{BNL stat.}$**  by summer 2020 (TDR goal)



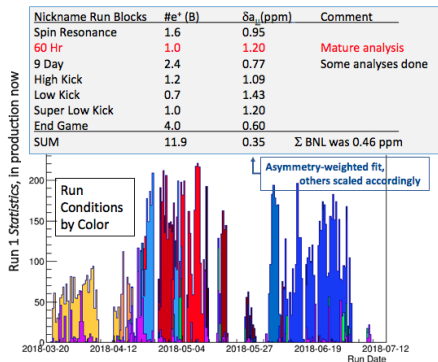
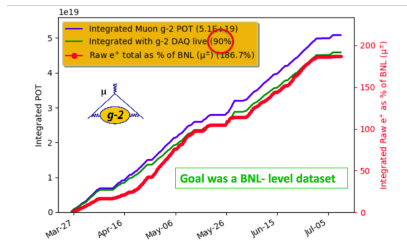
# Summary Run1 (2018)

- collected  $\sim 2 \times$  BNL statistics of physics data
- different experimental conditions  $\Rightarrow$  7 datasets
- offline reconstruction workflow requires 2 passes for embedding data quality conditions
- second step includes a data size reduction (accomplished by dropping most of the raw data)

Muon  $g-2$  Run 1 (2018) Production Summary

FILE TYPE	TB
Total Run 1 recorded DAQ files	1000
Physics Quality Production files 1 <sup>st</sup> pass	1266
Physics Quality Production files 2 <sup>nd</sup> pass *	633
<b>TOTAL</b>	<b>2899</b>

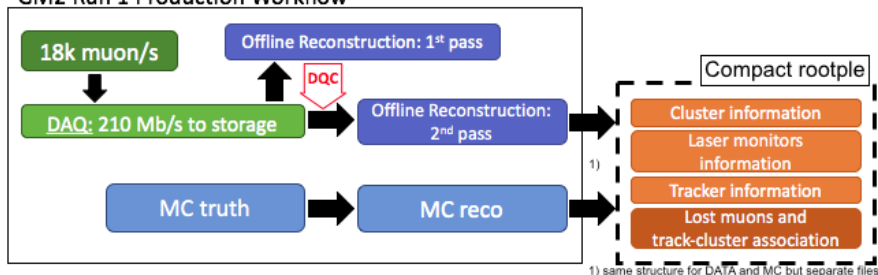
- Simulation for Run 1 studies:  
 $\sim 60$  TB (truth) +  $\sim 5$  TB (reco)



# Italian resources usage for Run1 (2018)

- 100 TB of storage at INFN Pisa:
  - ~ 2 TB to store 60h datasets and MC (reco) compact rootples (production of compact rootples workflow established - *Aug 18*)
  - ~ 58 TB to store compact rootples of the other datasets when 2nd pass is completed (*Sep/Oct 18*)
  - ~ 10 TB to store compact rootples from simulation when available (*Oct/Jan 18*)
  - ~ 30 TB disk space for analyzers and to store raw data for tuning/exercising the calibration (*Oct/Jan 18*)

## GM2 Run 1 Production Workflow



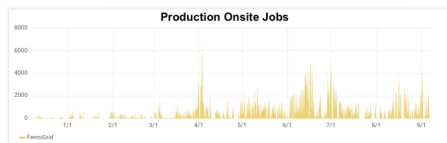
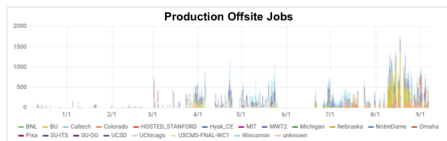
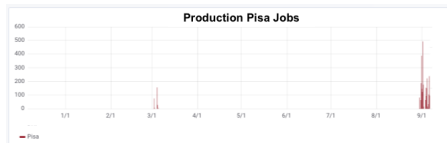
## 2018 recap and 2019/2020 requests

	Run1	Run2	Run3
BNL stat.	2	8	10
Raw DAQ data	1000 TB	3600 TB	4500 TB
<b>Raw DAQ data INFN Disk</b>	<b>20 TB</b>	<b>20 TB</b>	<b>20 TB</b>
Reco full DAQ data	650 TB	1800 TB	2200 TB
<b>Reco data compact INFN Disk</b>	<b>60 TB</b>	<b>140 TB</b>	<b>120 TB</b>
Simulation data	100 TB	1000 TB	400 TB
<b>Simulation compact INFN Disk</b>	<b>10 TB</b>	<b>80 TB</b>	<b>30 TB</b>
<b>Users space INFN Disk</b>	<b>10 TB</b>	<b>10 TB</b>	<b>10 TB</b>
<b>Total INFN Disk Estimate</b>	<b>100 TB*</b>	<b>250 TB</b>	<b>180 TB</b>

- reconstructed DAQ dataset and simulated data store as compact rootfiles tailored for  $\omega_a$  analysis and gain studies with  $\sim 90\%$  size reduction w.r.t. production files
- 10 TB/year disk space for users
- 20 TB/year of raw data to tune/exercise the calibration
- \* 100 TB for 2018 already assigned

# Pisa Grid Usage

- We are running production opportunistically on the Pisa Grid (first Italian site accessible by FIFE tools):
  - 13 Feb 2018: first job submitted by the Production Team in Pisa
  - 20 Feb 2018: completed test using single-core queue - added Pisa to the Offsite list
  - 30 Aug 2018: fixed pilot mapping issue and set up the multi-core queue
- Thanks to Enrico and Ken!



## Summary and Conclusion

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- for the analysis of the Run 1 data we have been assigned 100 TB: we established the workflow for the compact rootples and we start using this space.
- the request for 2019 (Run 2) is **250 TB of storage space**: 220 TB for compact rootples plus 30 TB for users and to test/improve the whole gain correction chain from raw data.
- the multi-core jobs in the Pisa grid are now enabled. Big accomplishment! For now, we are planning to keep running opportunistically.