Monitoring software performance with LHCbPR

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LHCb Performance and Regression framework

- **LHCbPR** is a framework for systematic monitoring of the LHCb software
- Provides performance baseline in **controlled conditions**
- Enables to **inspect any changes** due to e.g. MC generators, physics of Geant4, new external libraries, new MRs, DDDB tags, …
- **Compare results** across different compilers and architectures
- Not only to monitor resource consumption, but also to **measure the physics performance**
- Cf. nightly tests: larger statistics and more than boolean value

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- Configuration in **XML** files
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- Machines that tests are currently running on
  - `lblhcbpr1` with CC7 dedicated for timing tests (single executor in Jenkins), label: `perf-centos7-timing`
  - `lblhcbpr4` with CC7 (8 executors), labels: `perf-centos7, perf`
  - `volhcb05` with SLC6 (8 executors), labels: `perf-slc6, perf`
  - `hltperf-quanta01-e52630v4` for HLT throughput test

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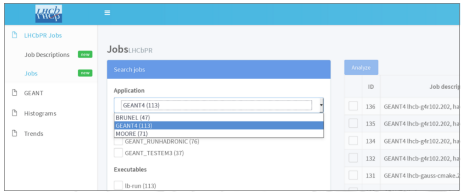
- **Web front–end** ▸ lblhcbpr.cern.ch
  - ▸ LHCbPR2FE
  - generic ROOT files viewer
  - trend analysis
  - custom modules



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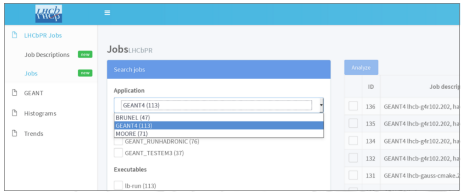
- Flexibility to push the results as HTML to EOS (at the level of LHCbPR2HD)
  - HLT case (rate and throughput tests)



Some statistics as of today

- 5 applications
  - Brunel
  - Gauss
  - Geant4
  - Moore
  - MooreOnline
- 44 option files
- 115 tests (running on several slots and platforms)
- 20–51 tests daily
- 14 tests dedicated for timing (thus running only on `lblhcbpr1` machine)
- Single tests run from several minutes up to 10 hours

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              {app_name}/{app_version} valgrind --tool=callgrind --dump-instr=yes
              --instr-atstart=no --cache-sim=yes --branch-sim=yes python
              $(lb-run -c {platform} --user-area={build} {app_name}/{app_version}
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"name": "perf-lb-run-gaudirun",
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- Create the **handler** to parse the output
  - many handlers already there, e.g. to parse `TimingAuditor`, output of `perf`, etc.
  - see README on: ▸ LHCbPR2HD

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schedule weekly or monthly

description of options `lblhcbpr.cern.ch/api/options`

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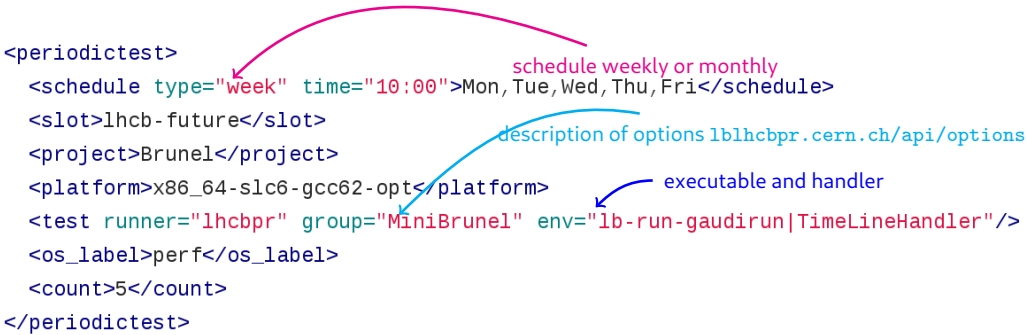


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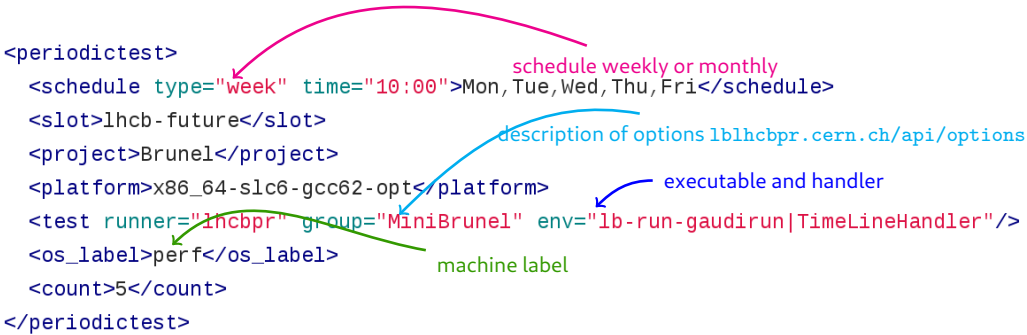

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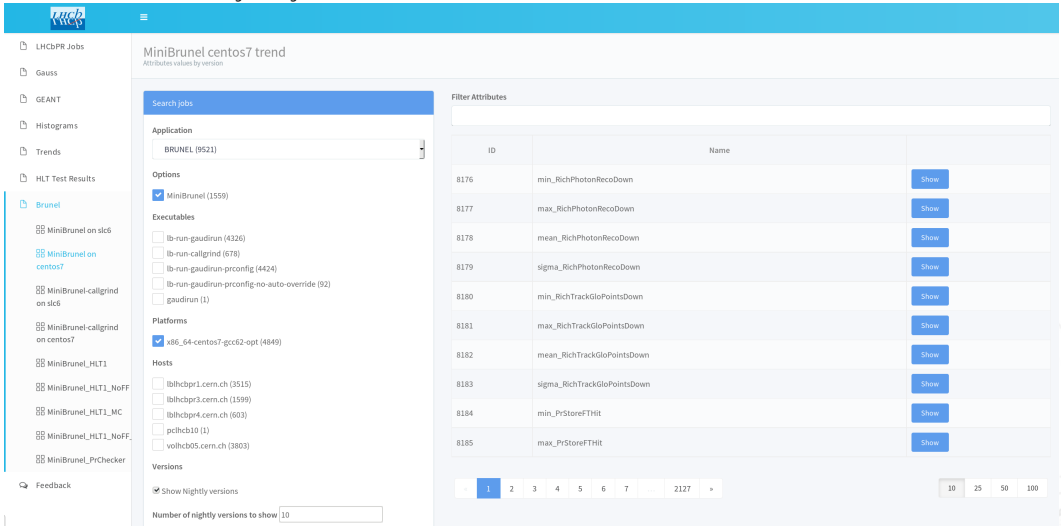
- (Optionally) create custom **analysis module** ▸ LHCbPR2FE
  - or re-use existing one ...

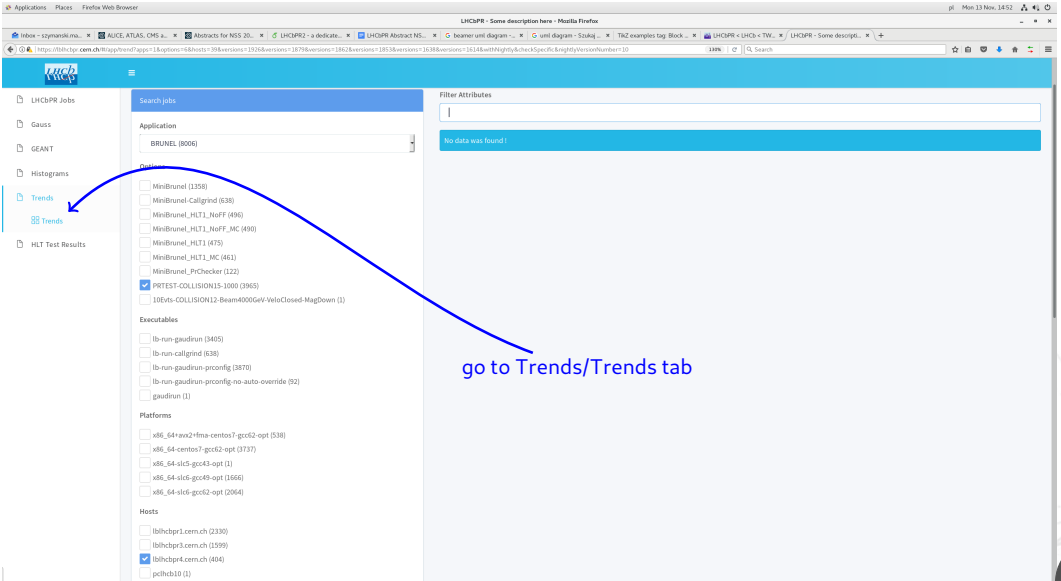
Trend module with predefined parameters

Plot last 10 measurements for a given algorithm



Using trend analysis

Plot the time spent by EVENT LOOP in Brunel test as a function of the software version



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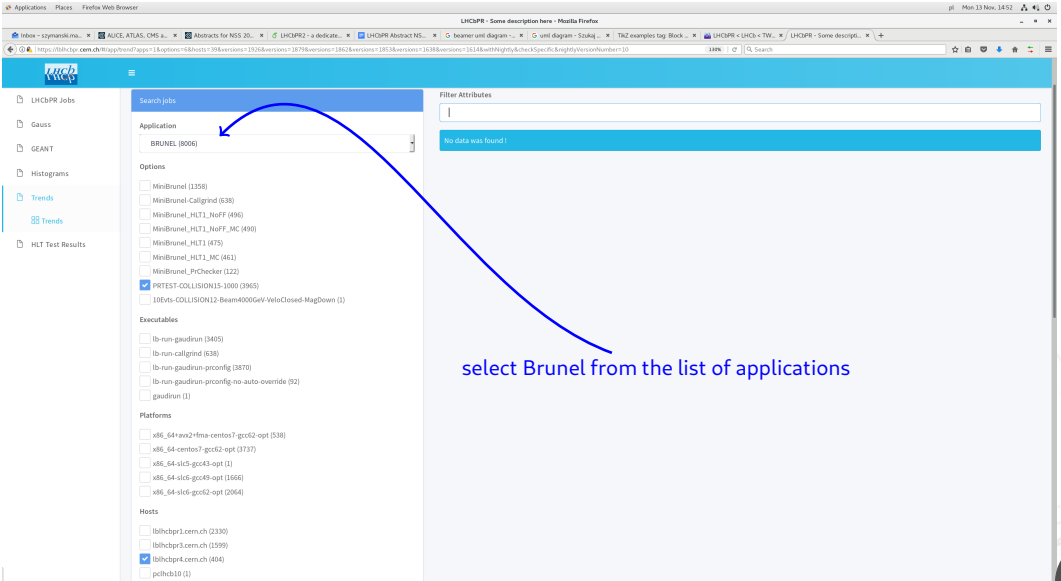

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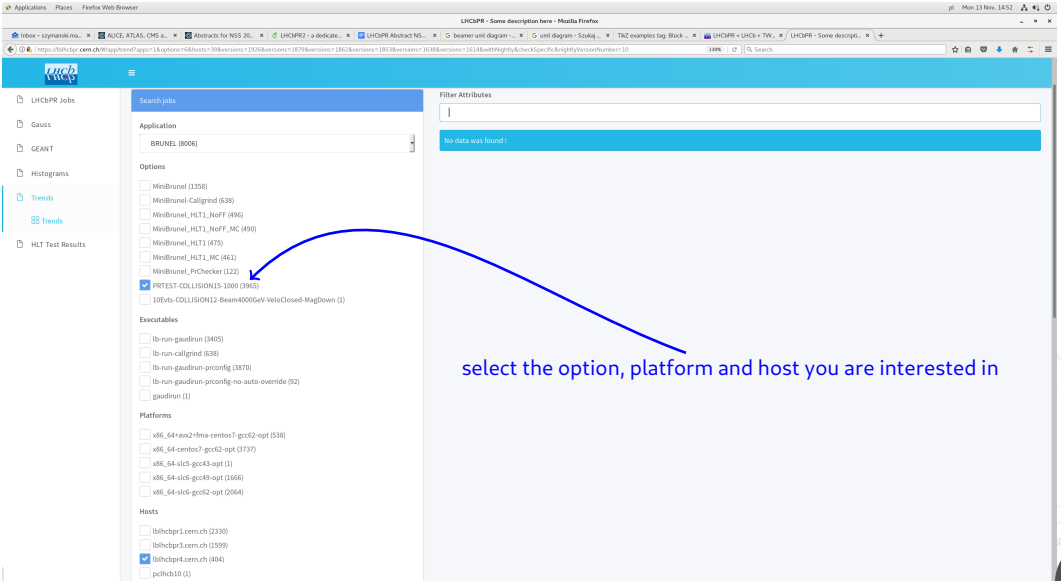

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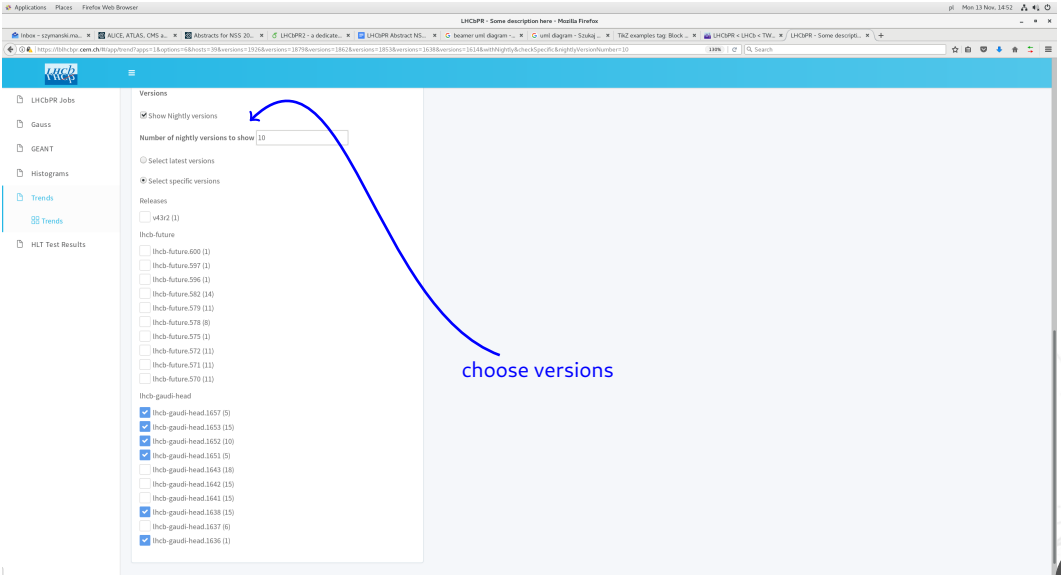

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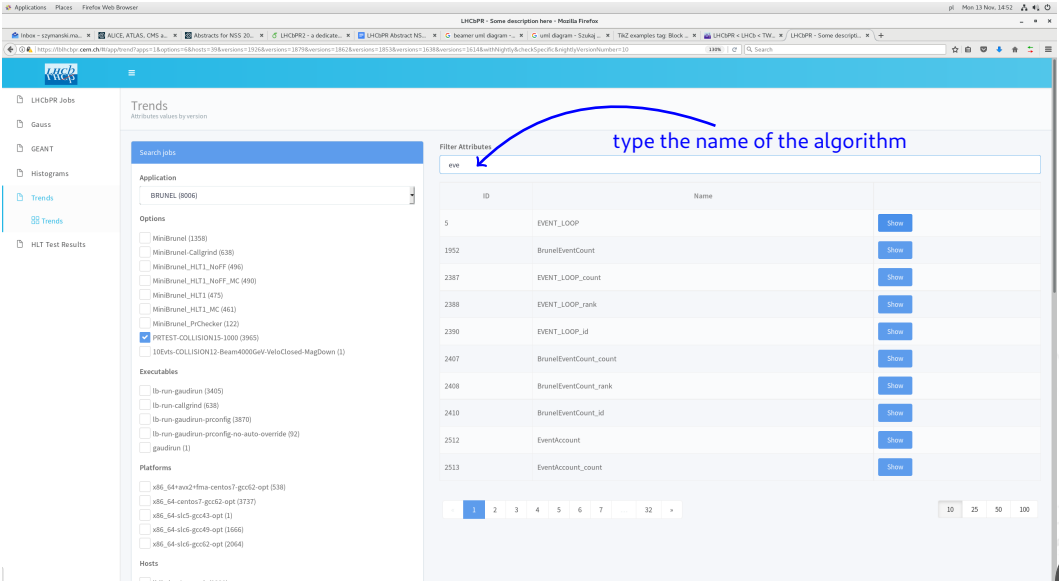

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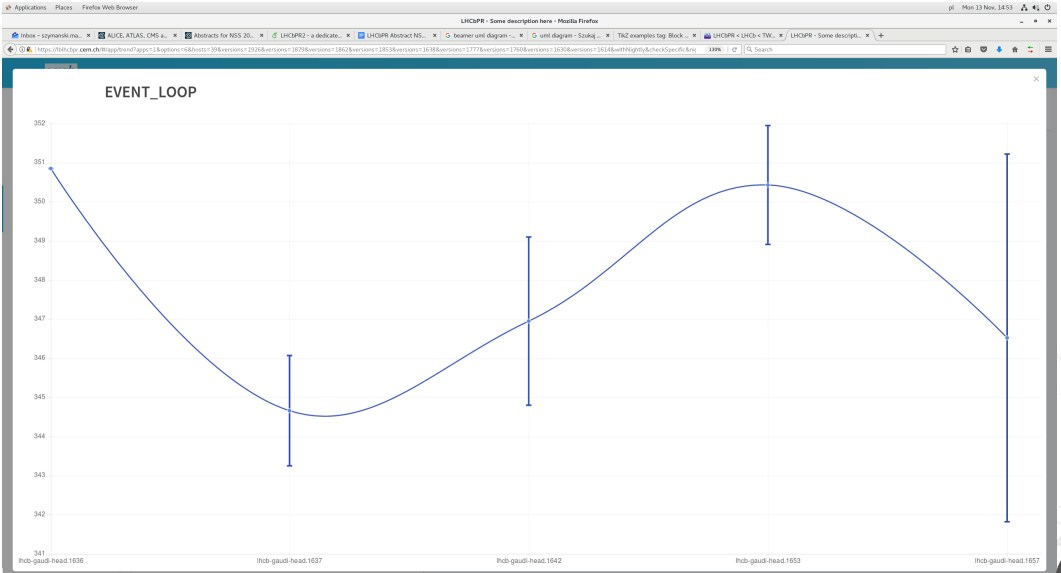

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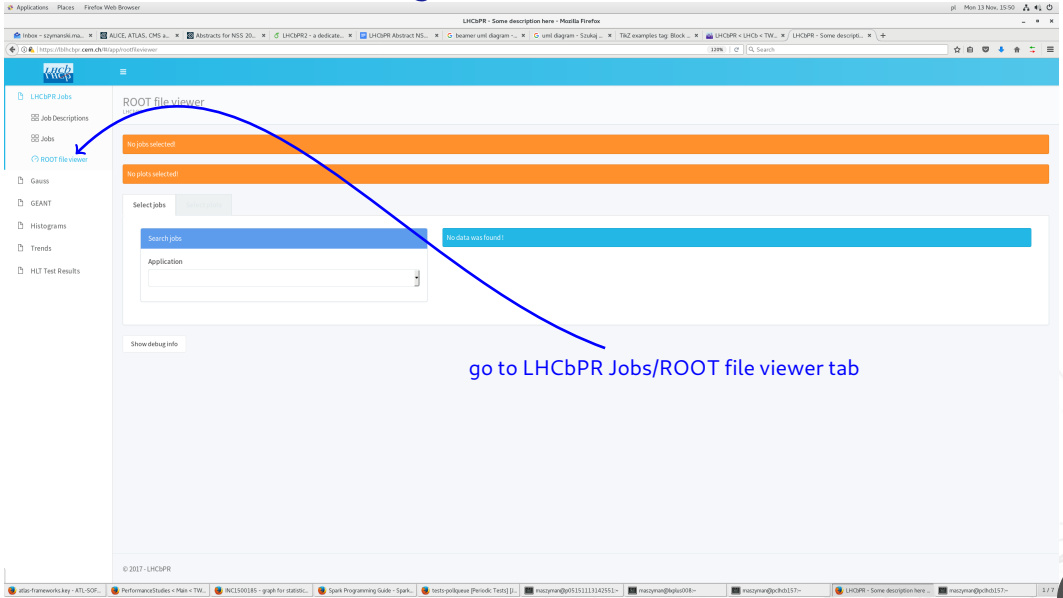

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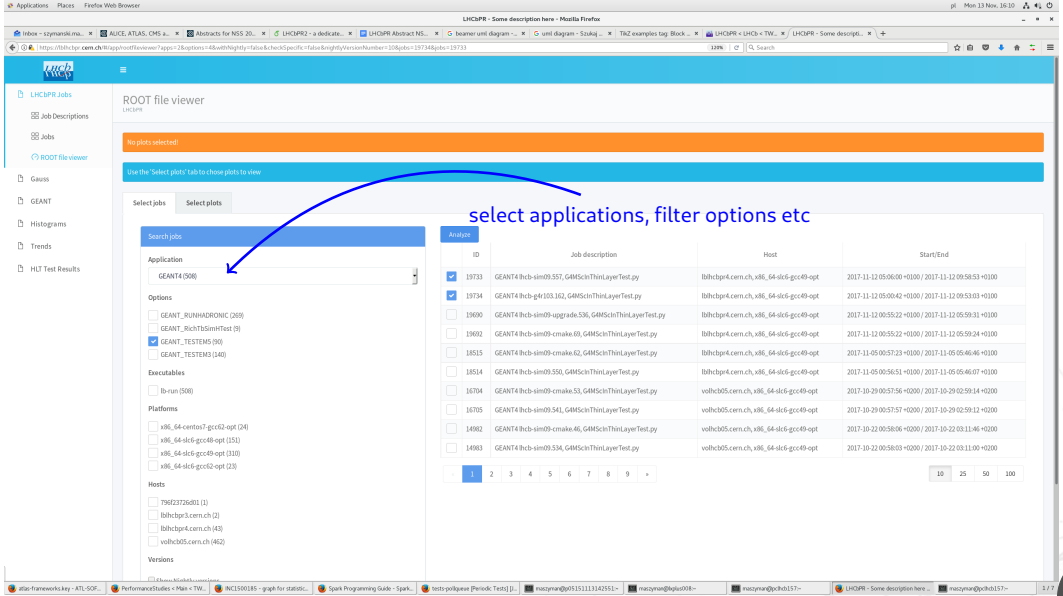

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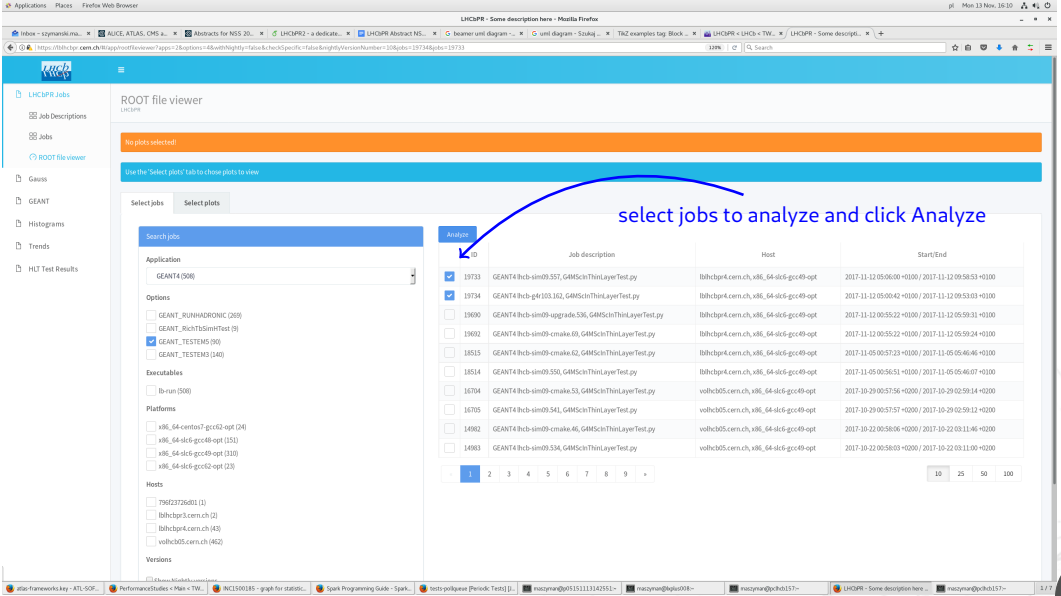

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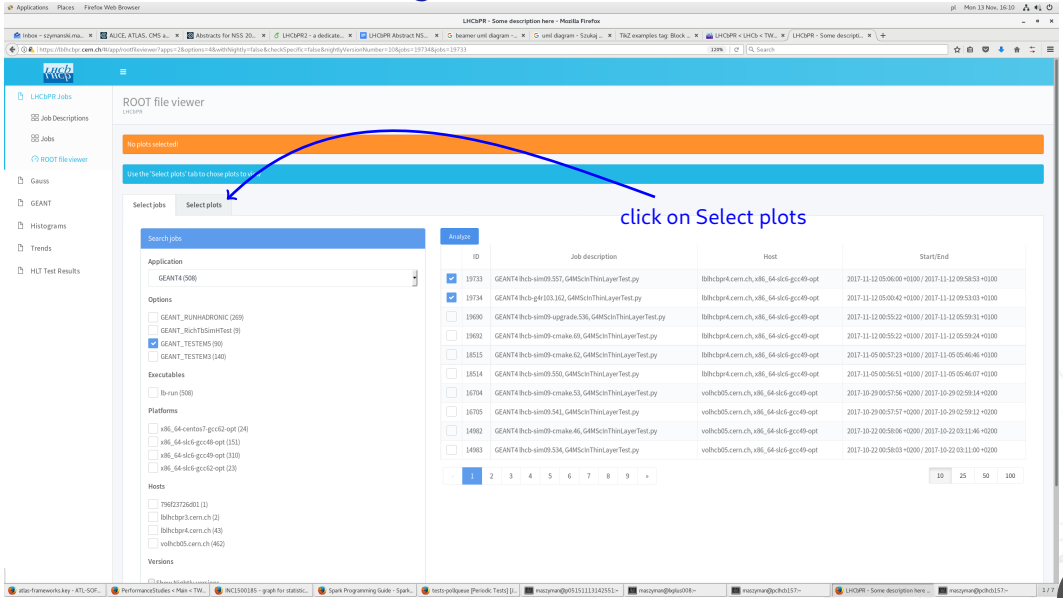

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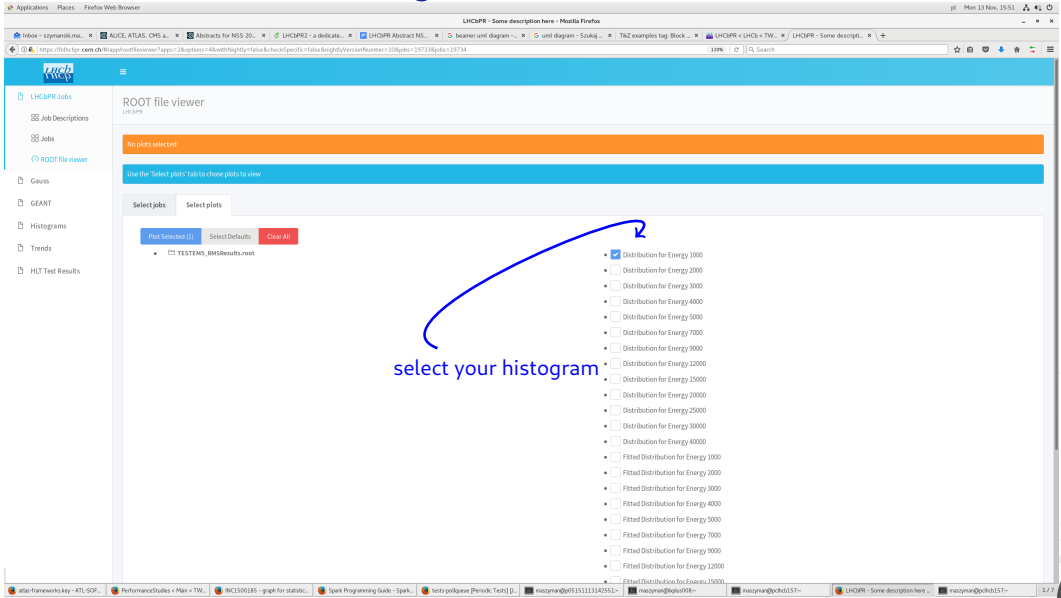

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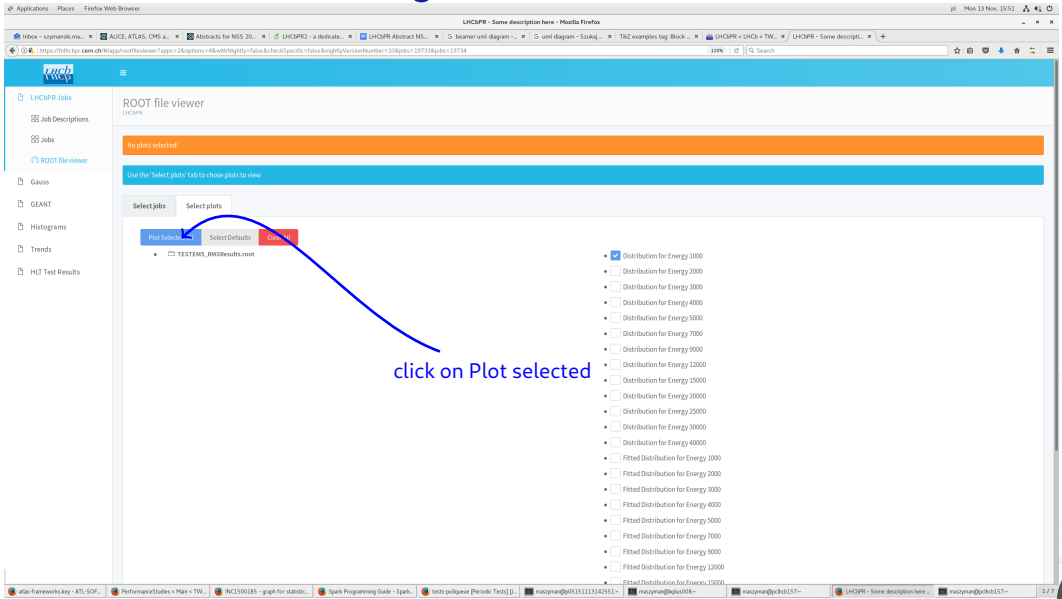

click on Plot selected

Using ROOT file viewer

Thank you!
Please give feedback on our ‣ mattermost channel

LHCbPR - Resources

- Web application:
  `https://lblhcbpr.cern.ch`
  `https://lblhcbpr.cern.ch/api/`
  `https://gitlab.cern.ch/lhcb-core/LHCbPR2FE`
- API service:
  `https://gitlab.cern.ch/lhcb-core/LHCbPR2BE`
- ROOT HTTP service:
  `https://gitlab.cern.ch/lhcb-core/LHCbPR2ROOT`
- Tests' output handlers:
  `https://gitlab.cern.ch/lhcb-core/LHCbPR2HD`
- Project builder:
  `https://gitlab.cern.ch/lhcb-core/LHCbPR2`
- Jenkins configuration
  `https://gitlab.cern.ch/lhcb-core/LbNightlyTools`
- Configuration of the periodic tests
  `https://gitlab.cern.ch/lhcb-core/LHCbNightlyConf/`