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Beam Spot Monitoring

Introduction

This twiki describes the ongoing development of implementing beam spot monitoring to Online/Offline DQM and how to use it.

How to use it

1) Check out the codes:

```
cmsrel CMSSW_2_2_5
cd CMSSW_2_2_5/src
cmsenv
cmscvsrcroot CMSSW
cvs co -d UserCode/BeamSpotMonitoring UserCode/Jeng/BeamSpotMonitoring
scramv1 b
cd UserCode/BeamSpotMonitoring/test/
```

2) Start DQM Gui Server:

- To test the codes with DQM gui. You have to install DQMGui server on a local machine first. You can follow the instruction under the section of "Specific details" in this page: <https://twiki.cern.ch/twiki/bin/view/CMS/DQMTest>
- Follow the instruction under the section of "Starting the GUI server"
- Remember to stop GUI server and collector when you are done with the test. See "Stopping the GUI server and the collector"

3) Edit `dqmStandalone_cfg.py` (or `dqmReadFromRAW_cfg`), change <DQM Gui Server Host> to the machine that runs gui service

```
process.ep = cms.EndPath(process.outP)
process.p = cms.Path(process.dqmSource+process.dqmClient+process.dqmEnv+process.dqmSaver)

process.DQMStore.verbose = 0
process.DQMStore.collateHistograms = False

process.DQM.collectorHost = "<DQM Gui Server Host>"
process.DQM.collectorPort = 9190

process.dqmSaver.convention = 'Online'
process.dqmSaver.dirName = '/tmp'
process.dqmSaver.producer = 'DQM'

process.dqmEnv.subSystemFolder = 'BeamSpotMonitor'
```

4) Run:

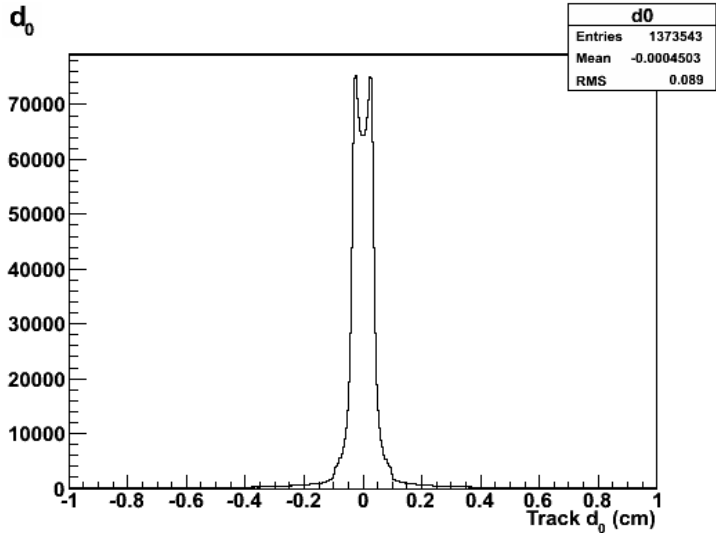
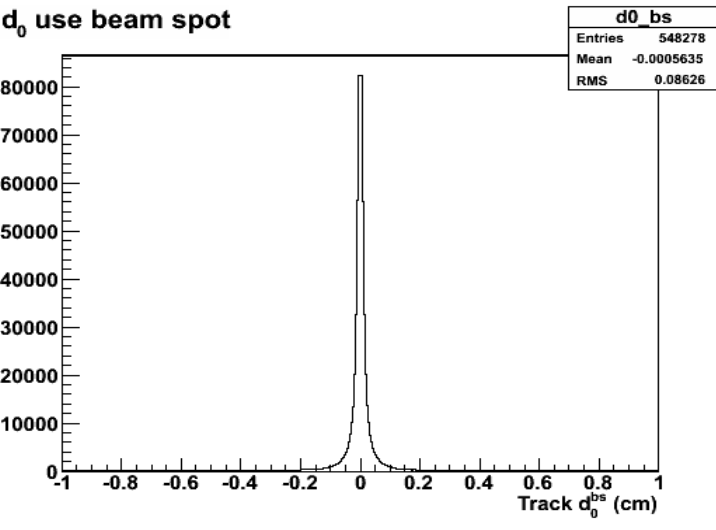
```
cmsRun dqmStandalone_cfg.py
```

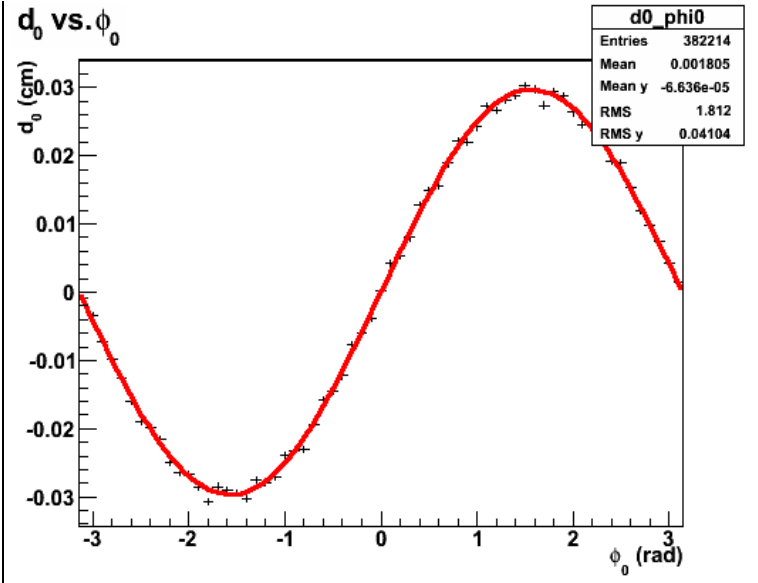
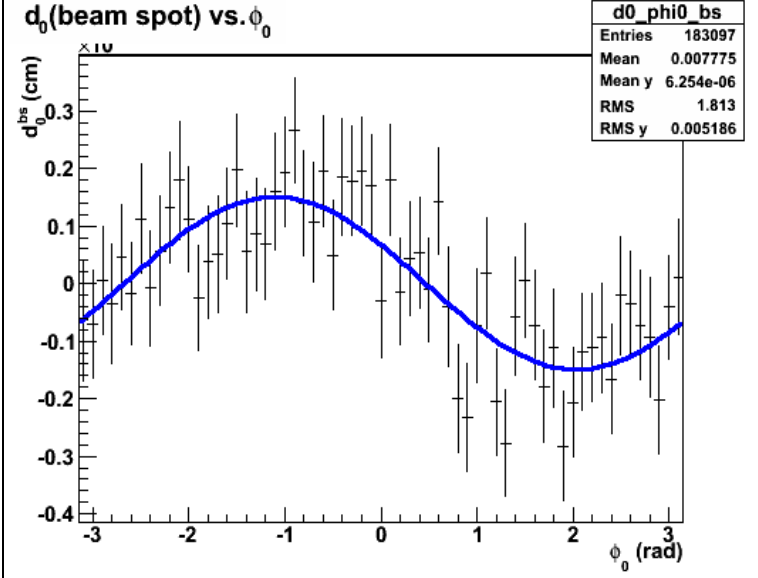
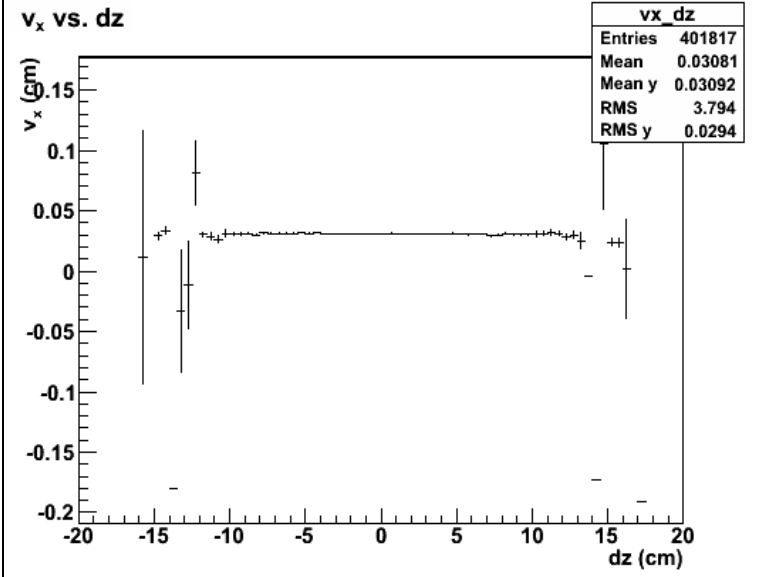
5) Open web browser to check histograms:

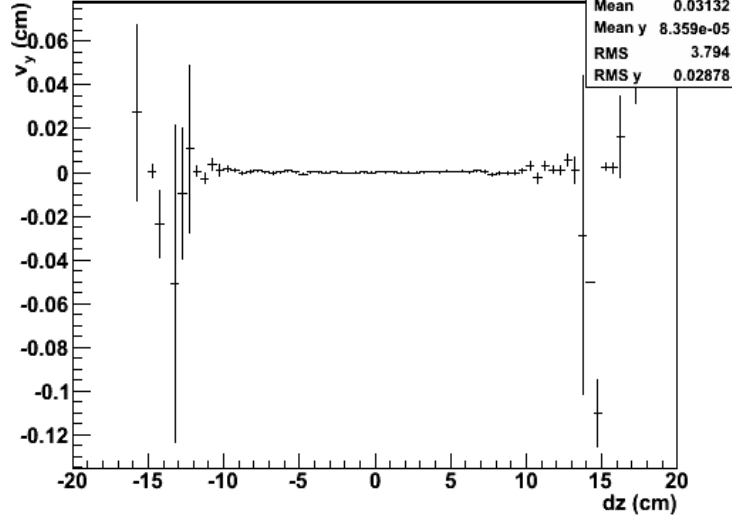
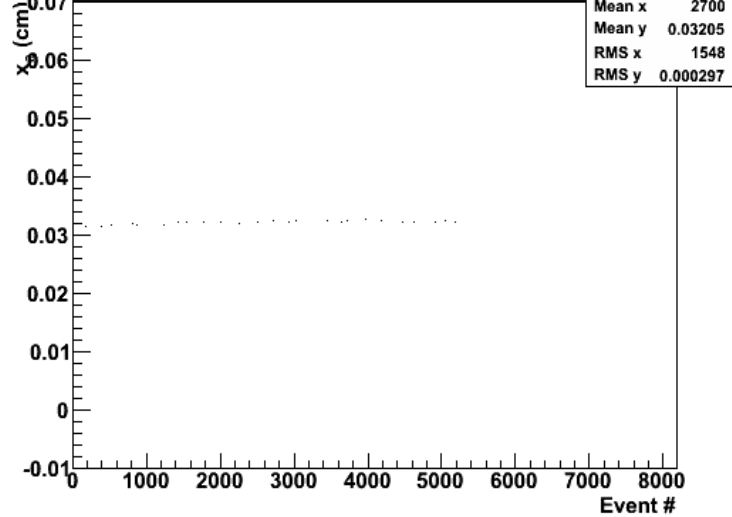
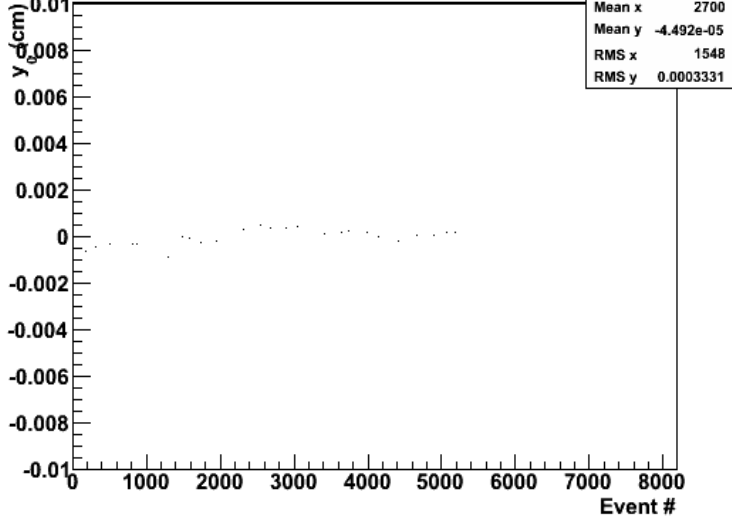
<http://<DQM Gui Server Host>:8888/dqm/devtest>

Histograms

Lists of the proposed histograms:

Histogram Name	Type	Description	Note for shifter
<p>d0</p> 	1D	d0 of tracks calculated with respect to (0,0).	Double peak seen for displaced beam line. This already exists in tracker DQM. Shown here for comparison only.
<p>d0_bs</p> <p>d0 use beam spot</p> 	1D	d0 calculated w.r.t. beam spot (from offlineBeamSpot, which is a collection of beam spot objects from DB. Constant at the moment).	Should see only one peak centers at 0 for good beam fitting results.
	Profile	Track d0-phi0 correlation.	Sinusoidal for displaced beam line

<p>d_0 vs. ϕ_0</p>  <table border="1" data-bbox="783 159 938 300"> <thead> <tr> <th colspan="2">d0_phi0</th> </tr> </thead> <tbody> <tr> <td>Entries</td> <td>382214</td> </tr> <tr> <td>Mean</td> <td>0.001805</td> </tr> <tr> <td>Mean y</td> <td>-6.636e-05</td> </tr> <tr> <td>RMS</td> <td>1.812</td> </tr> <tr> <td>RMS y</td> <td>0.04104</td> </tr> </tbody> </table>	d0_phi0		Entries	382214	Mean	0.001805	Mean y	-6.636e-05	RMS	1.812	RMS y	0.04104			
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d0_phi0_bs															
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Plan

- Add z_0 , σz_0

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- Add error plots from the beam fit. ex. $x0Err$, $y0Err$, $dxdzErr$, $dydzErr$, $z0Err$, $sigmaz0Err$

-- GengyuanJeng - 30 Mar 2009

This topic: Sandbox > BeamSpotMonitoring

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