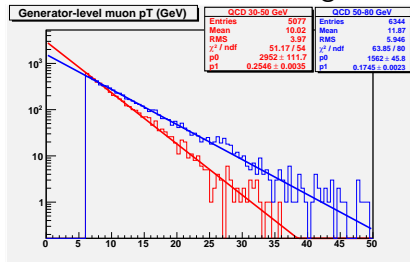


Muon HIP Alignment CSA07 Plan

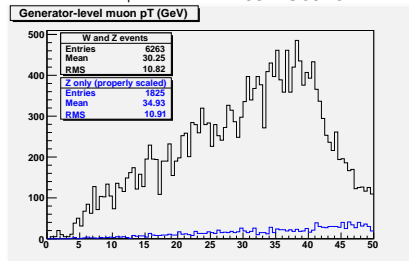
- ▶ We want to study the effect of QCD muons on alignment by repeating the alignment process on realistic soups with different p_T cuts
- ▶ Three cuts: 20 GeV, 30 GeV, 40 GeV \rightarrow 30 GB total
- ▶ Align each of the three samples times two modes (globalMuon, standAloneMuon) times three subdivisions of the data for dependence on statistics (90%, 9%, and 1%)
- ▶ Order of operations in each study:
 1. Wheel/disk alignment with a 1000 events: well under an hour
 2. 1 globalMuon iteration (12 hours) concurrent with 7 standalone iterations (12 hours when divided into 7 subsamples): $8 \times 9 = 72$ jobs
 3. CSC layer alignment, same conditions: 12 hours, 72 jobs
- ▶ (Second globalMuon iteration for checking residuals is in the CSC layer alignment)
- ▶ Maximum of 72 jobs for a total of 25 hours with 81×14 MB + 81×80 MB = 7 GB of histogram output

Determination of the p_T cut (biggest μ p_T in the event)

QCDmu muons in semilog scale



$W + Z$ in linear scale



We always want $\sim 100k$ $W + Z$ events, so that sets the normalization
 $\text{AlCaRecoMu} = 17 \text{ kB}/\text{muon}$ due to two copies of RecHits

	p_T cut	events	disk space	alignment time/iteration
	10 GeV	6.1 million	130 GB	76.3 hours
	15 GeV	2.3 million	48 GB	28.7 hours
→	20 GeV	0.94 million	21 GB	11.8 hours
	25 GeV	0.45 million	9.4 GB	5.6 hours
→	30 GeV	0.25 million	5.2 GB	3.1 hours
	35 GeV	0.17 million	3.6 GB	2.1 hours
→	40 GeV	0.14 million	3.0 GB	1.8 hours

Conditions for the samples

- ▶ Source of QCD muons: QCDmu_Pt_30_50 through QCDmu_Pt_170_230 in the correct proportions
- ▶ Three statistically independent samples: *different* events
- ▶ Miscalibrated chambers (10 pb^{-1} scenario)
- ▶ Realistically misaligned tracker (10 pb^{-1} scenario)
- ▶ Wheels/disks misaligned 3 mm and 1 mrad in all directions/angles
- ▶ Chambers misaligned 3 mm and 1 mrad in all directions/angles
- ▶ CSC layers misaligned $191 \text{ }\mu\text{m}$ in x , $335 \text{ }\mu\text{m}$ in y and 0.04 mrad in ϕ_z
- ▶ No DT layer/superlayer misalignment

Basic questions

- ▶ Do I write all of the scripts and submit them myself? Who presses the “go” button?
- ▶ We can use AlignmentMuonSelectorModule to apply the p_T cuts, but with a second invocation and outside the .cff file. Is this allowed?

