

I have been told I have got 3' ... so we have 20" per slide!

ABSTRACT

In the Muon Ionization Cooling Experiment (MICE) at RAL, muons are produced and transported in a dedicated beam line connecting the production point (target) to the cooling channel. We discuss the main features of the beamline, meant to provide muons with momenta between 140 MeV/c and 240 MeV/c and emittances up to 10 mm rad, which is accomplished by means of a diffuser. Matching procedures to the MICE cooling channel are also described. In summer 2010 we performed an intense data taking campaign to finalize the calibration of the MICE PID detectors and the understanding of the beam line, which completes the STEPI phase of MICE. We highlight the main results from these data with an eye to future activities.

Which plots to show?

reminder-1: all are VERY preliminary results, and we need to consolidate the analysis ...

reminder-2: we are not discovering the Higgs boson. This is a muon tap and we want a good flow ...

So we need to be honest and rigorous BUT what you have seen is what we 've got so far

Having said that, my structure for the Mumbai talk is as follows

- General philosophy behind the beam line
 - purity and transmission
 - matching to mice
 - (e,P) Matrix
- DATA & Analysis (leaving most of the latter to Mark)
 - summer of 2010
 - \pm polarities and muon rates (*Q! can we agree on a NUMBER?*)
 - species in the beam / proton absorber
 - scans (first results)
 - some flashes of first results ...

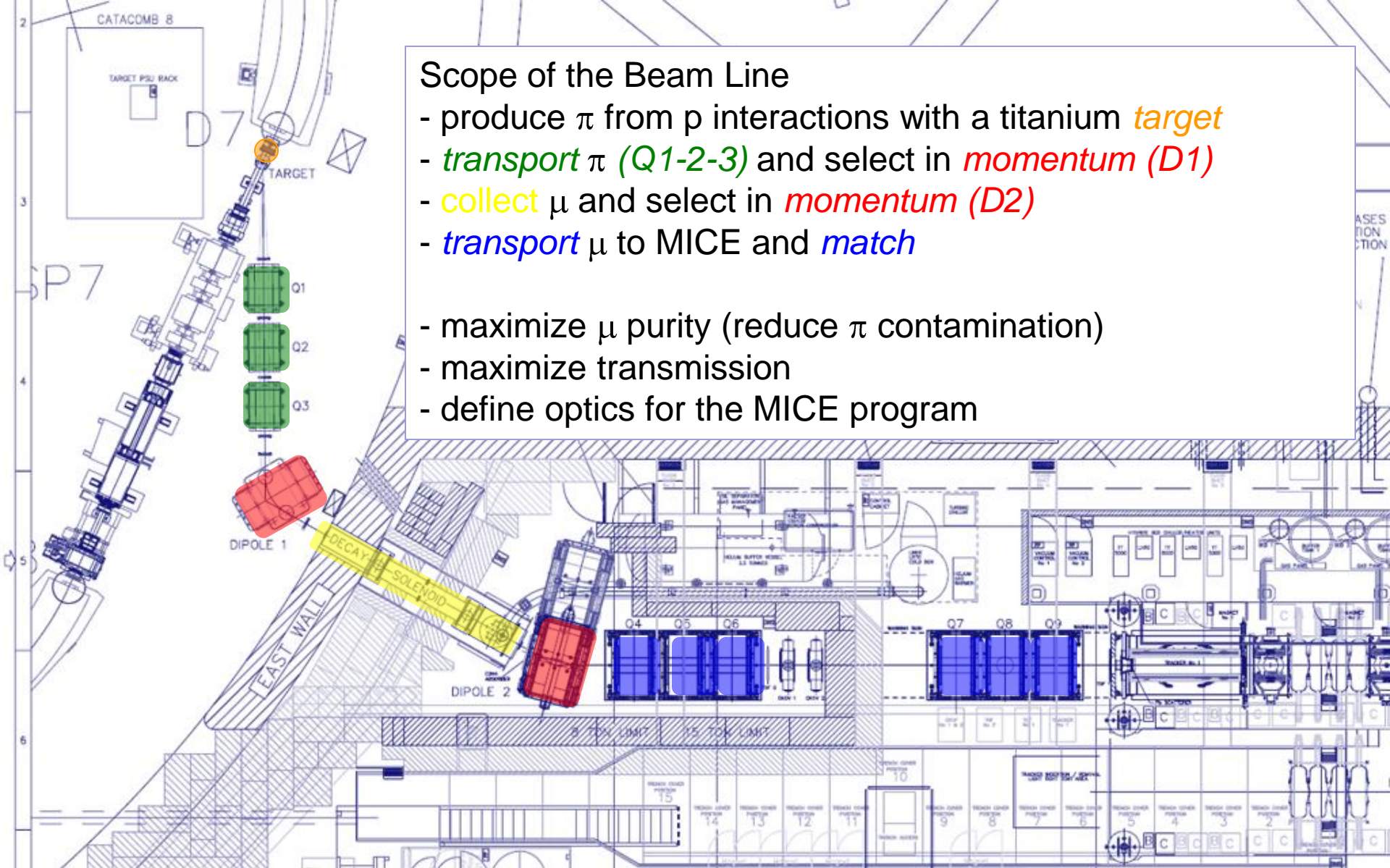
- *Run at high beam losses (2-3V)*
- *See ~20 μ^+ /~5 μ^- per target dip (every ~3 sec)*
- *Reached a maximum of 10V losses recently*

-- observed rates in MICE 2010 (6mm beam)

4 TOF1/ms/V_BLM for μ^- beam,
25 TOF1/ms/V_BLM for μ^+ beam

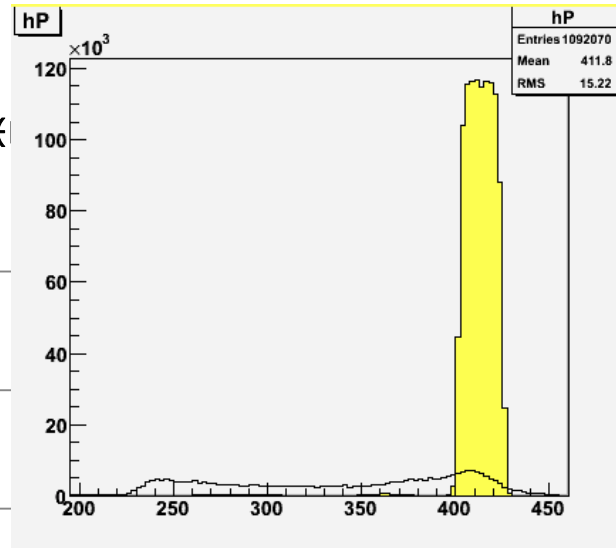
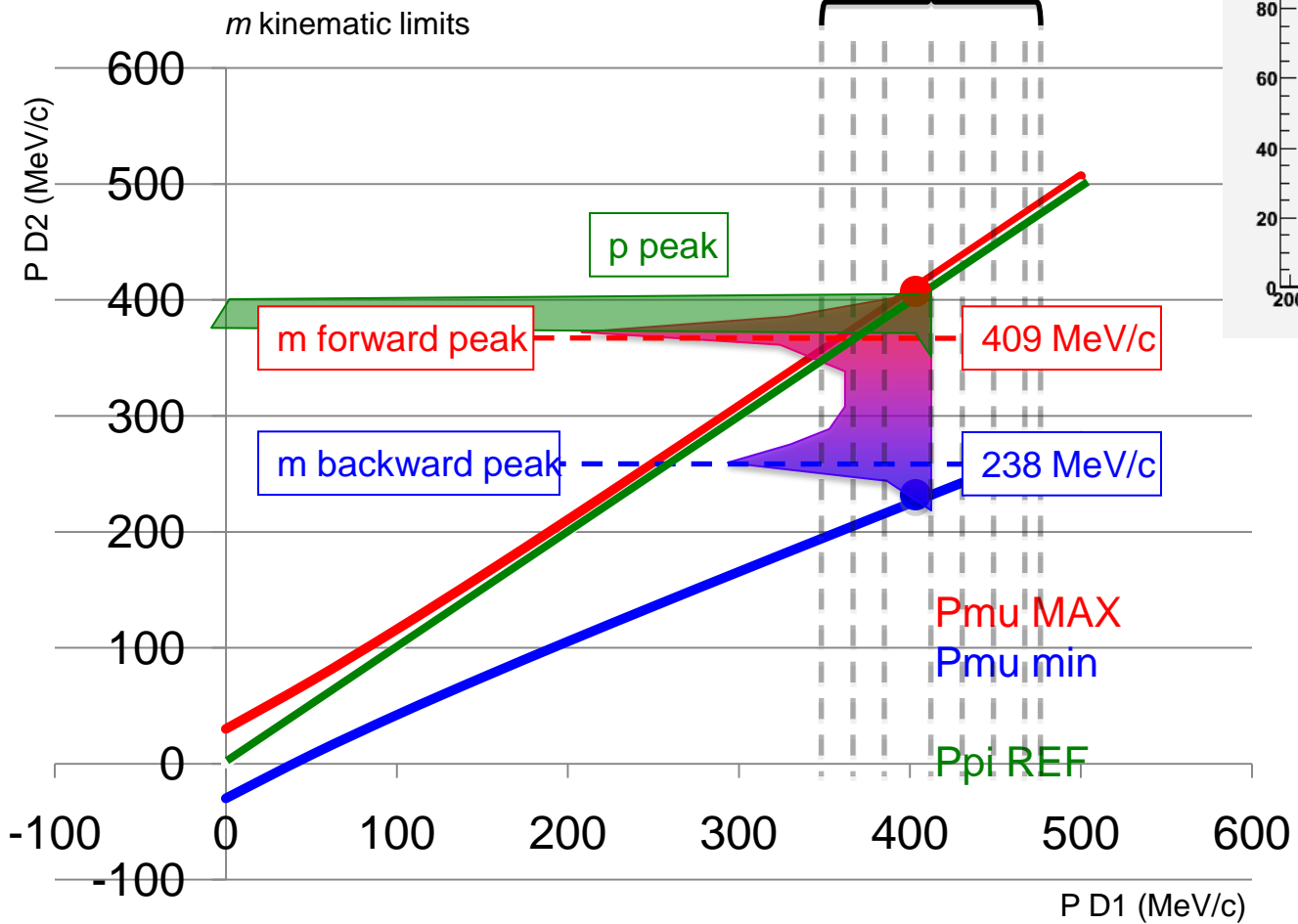
Scope of the Beam Line

- produce π from p interactions with a titanium *target*
 - *transport* π (Q1-2-3) and select in *momentum* (D1)
 - *collect* μ and select in *momentum* (D2)
 - *transport* μ to MICE and *match*
-
- maximize μ purity (reduce π contamination)
 - maximize transmission
 - define optics for the MICE program



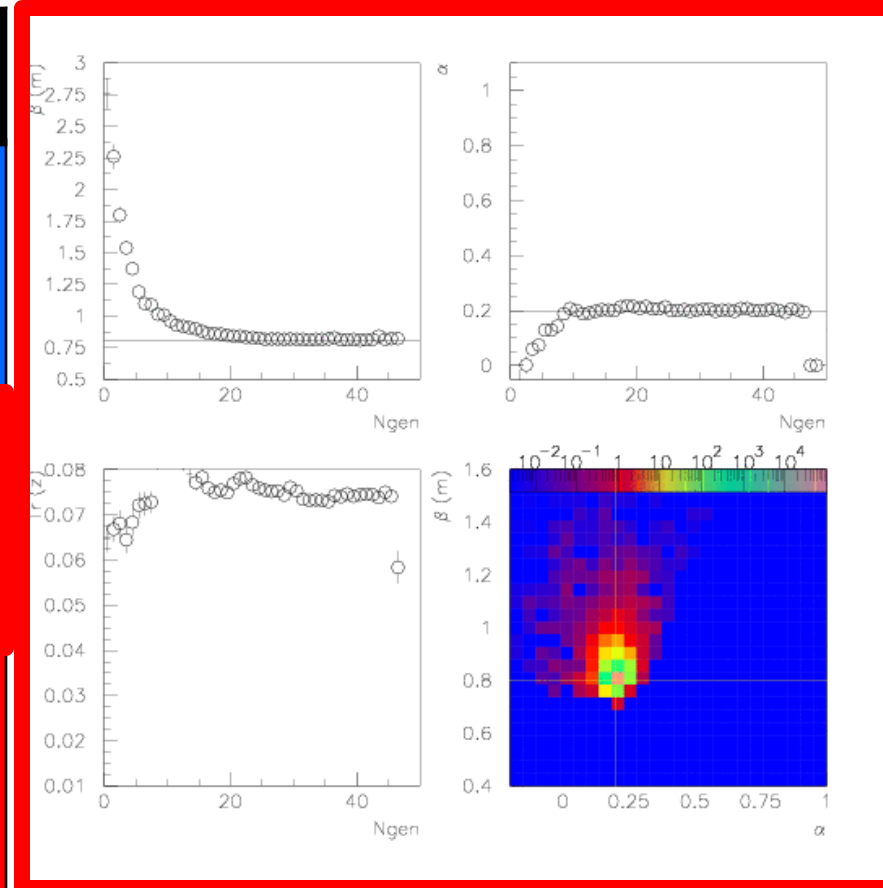
- μ purity
- select backward going m (D2)

ν_e μ ν_μ ν_τ ν_e ν_μ ν_τ ν_e ν_μ ν_τ



(ϵ, P) matrix concept
 - define Q4-9 to match the cooling channel beam

	140	200	240
3	Ptgt=321.3/Psol=1 85 Pdif=151 $\alpha=0.2$ $\beta=0.56$ m t=0.0 mm	Ptgt=390/Psol=23 1 Pdif=207 $\alpha=0.1$ $\beta=0.36$ m t=0.0 mm	Ptgt=453.6/Psol= 265 Pdif=245 $\alpha=0.1$ $\beta=0.42$ m t=0.0mm
6	Ptgt=327.6/Psol=1 89 Pdif=148 $\alpha=0.3$ $\beta=1.13$ m t=5.0 mm	Ptgt=408.6/Psol= 238 Pdif=215 $\alpha=0.2$ $\beta=0.78$ m t=7.5 mm	Ptgt=471.6/Psol= 276 Pdif=256 $\alpha=0.2$ $\beta=0.8$ m t=7.5mm
10	Ptgt=338.4/Psol=1 95 Pdif=164 $\alpha=0.6$ $\beta=1.98$ m t=10 mm	Ptgt=429.3/Psol= 251 Pdif=229 $\alpha=0.4$ $\beta=1.31$ m t=15.5 mm	Ptgt=486/Psol=28 5 Pdif=267 $\alpha=0.3$ $\beta=1.29$ m t=15.5 mm



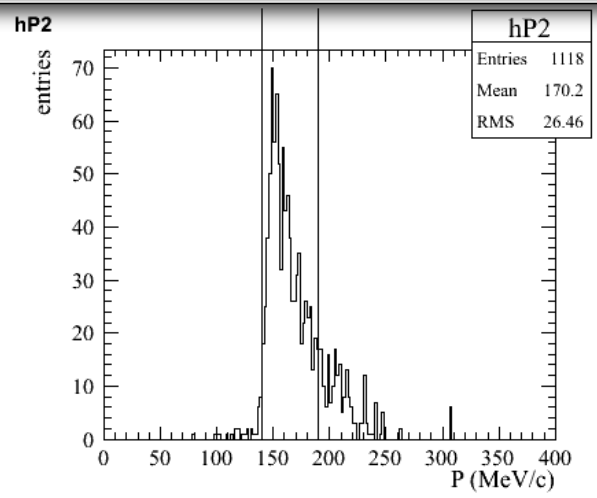
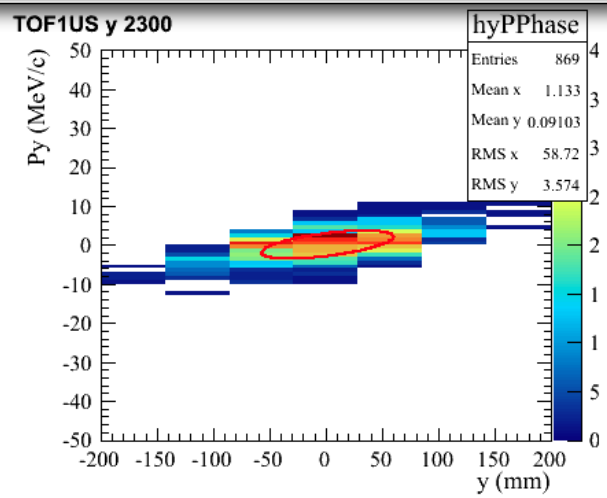
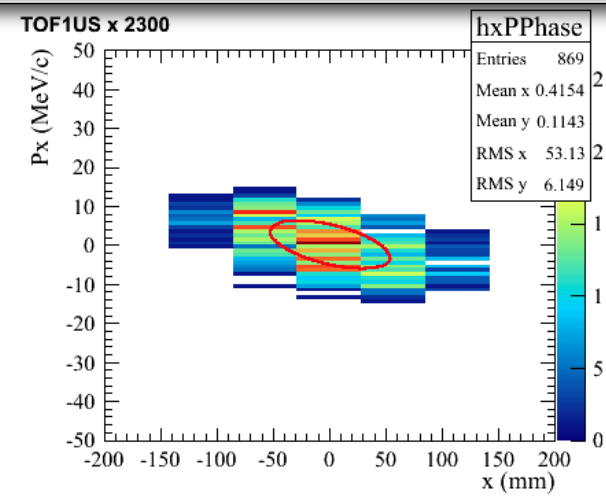
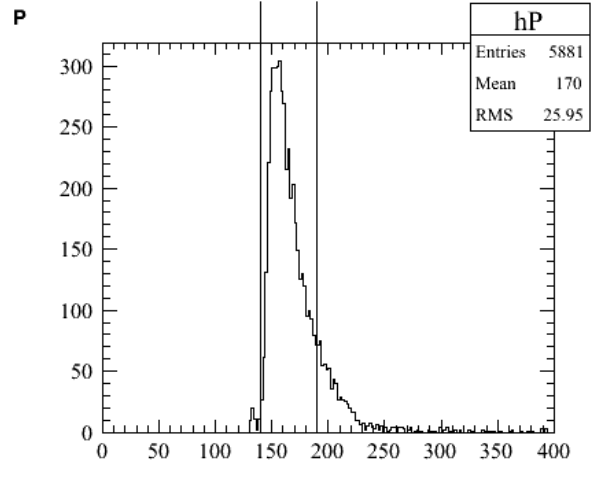
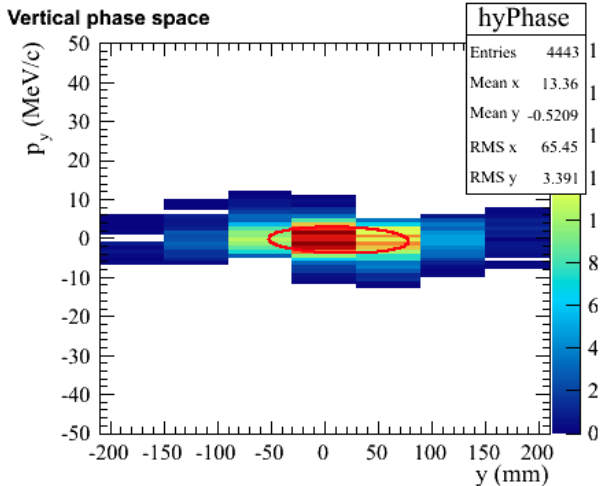
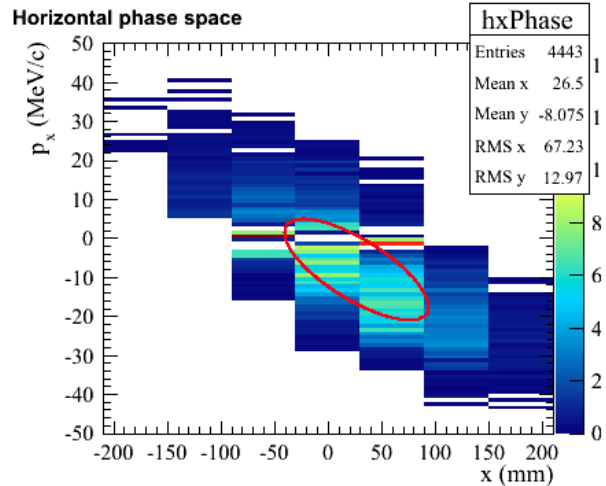
Example: are we happy to show this?

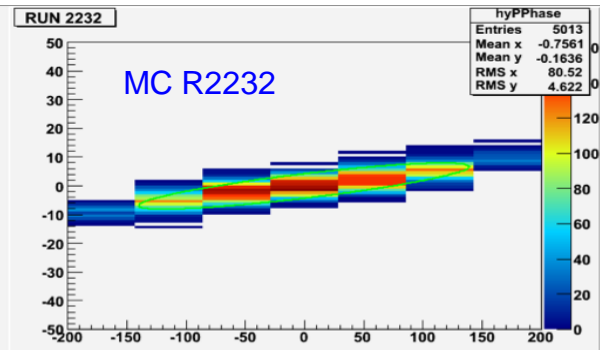
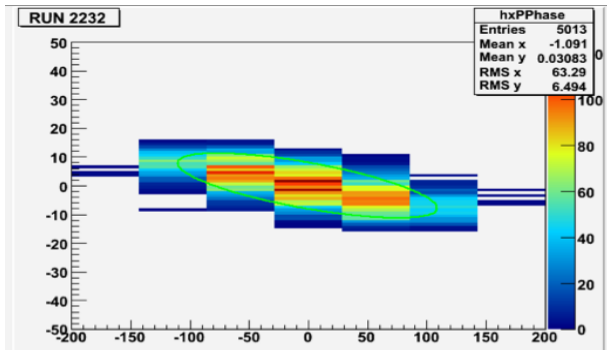
DATA

BeamLoss (mV)	Trig/spill	# of Triggers	Trig. Type	Spill gate (ms)	ISIS RepRate
1500	14	18984	TOF1	3.2	50 Hz

MO 3-140 R2300

TOF1US 2300
File Edit View Options Tools Help

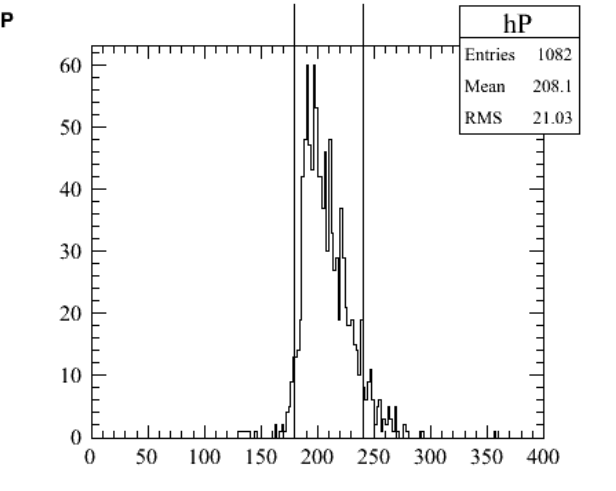
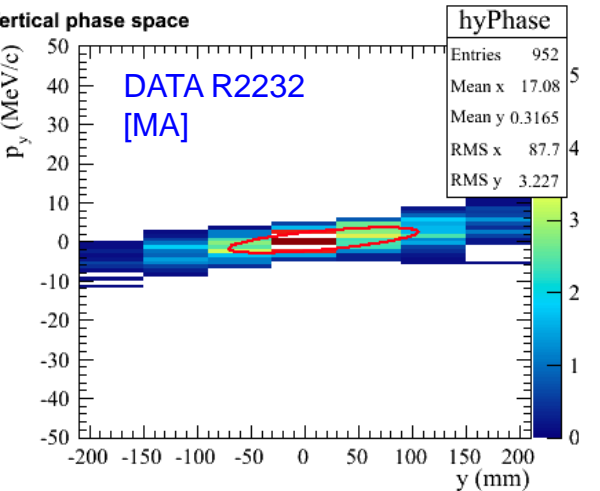
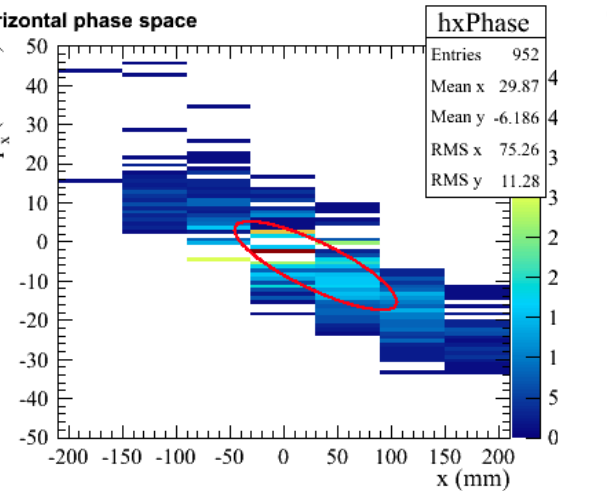
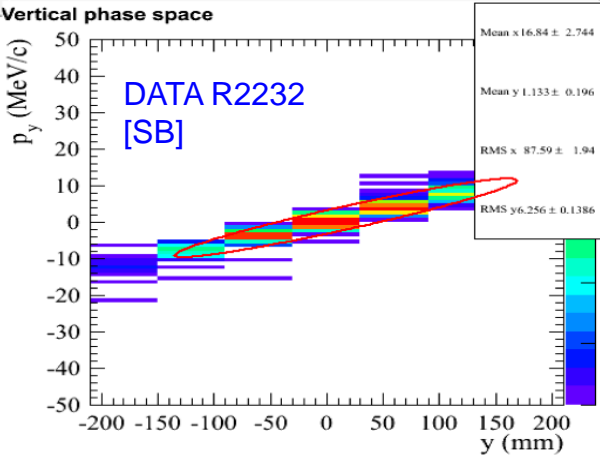
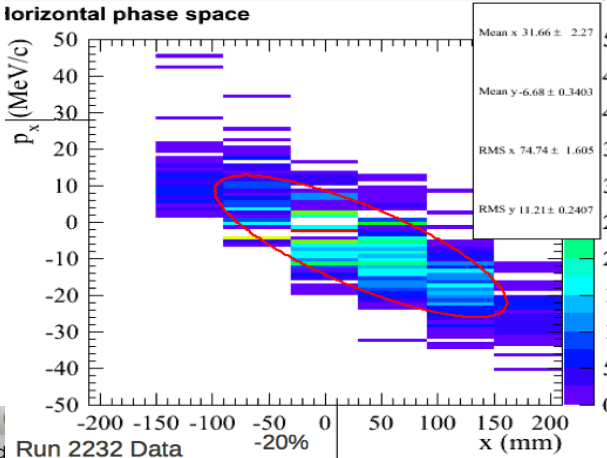




Need to freeze a geometry / calibration set of cuts

reproducibility:
R2232 (august)
which cuts?

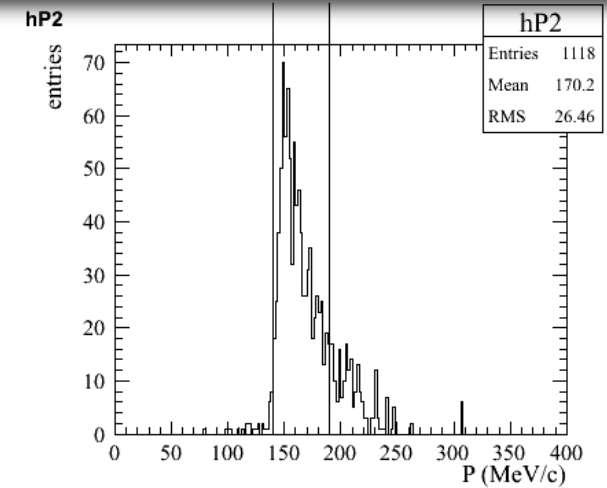
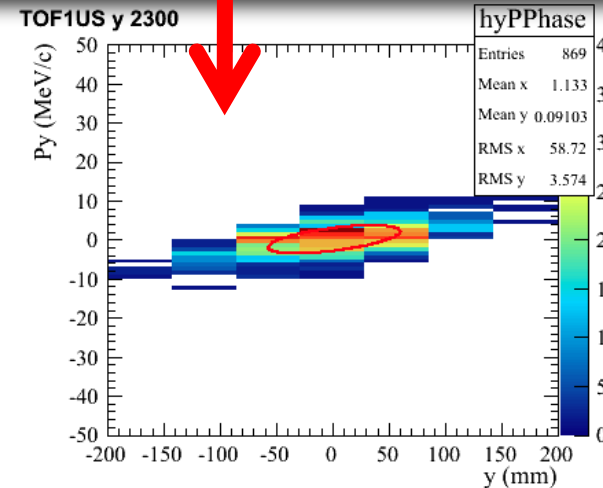
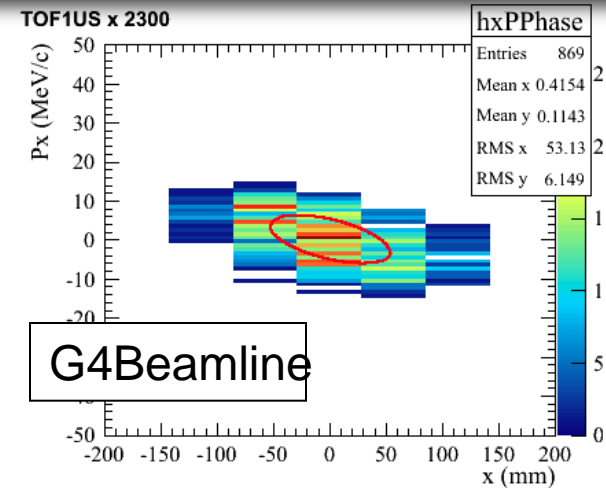
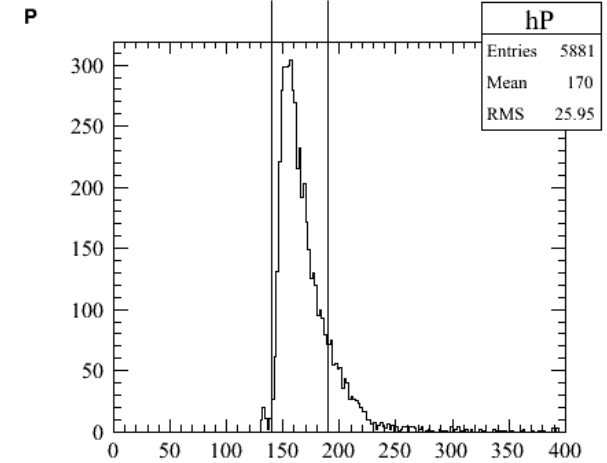
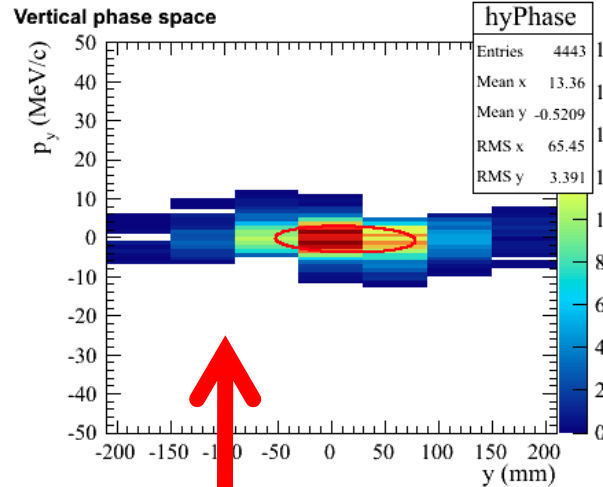
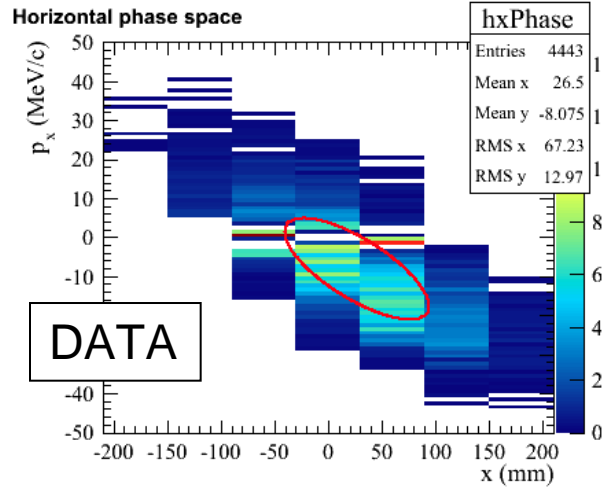
R2232(october)



Example: are we happy to show this?

M0 3-140 R2300

BeamLoss (mV)	Trig/spill	# of Triggers	Trig. Type	Spill gate (ms)	ISIS RepRate
1500	14	18984	TOF1	3.2	50 Hz



And this?

M0 6-200 R2244

