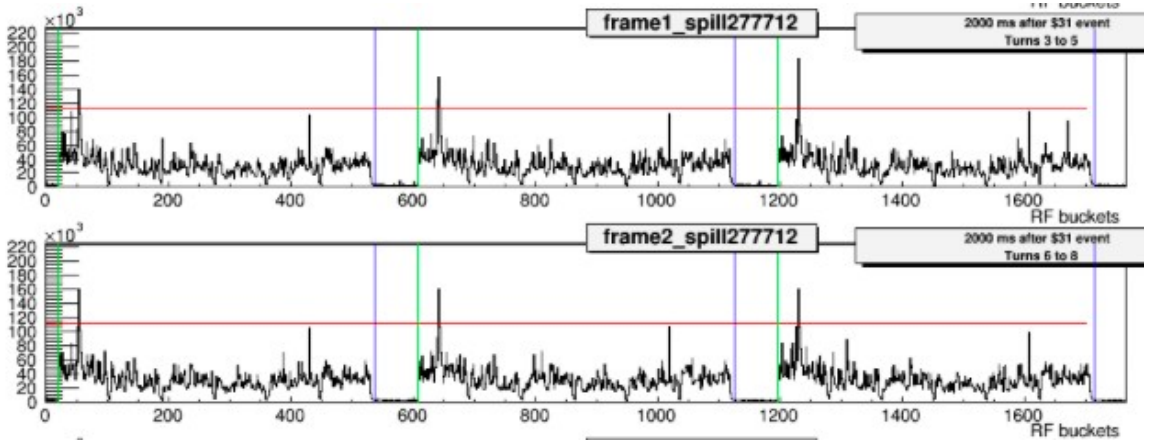
Status of E-906/SeaQuest

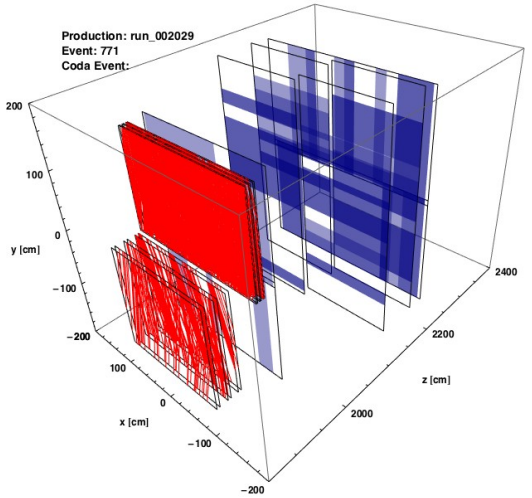
– an unpolarized fixed-target Drell-Yan experiment

Markus Diefenthaler (UIUC)

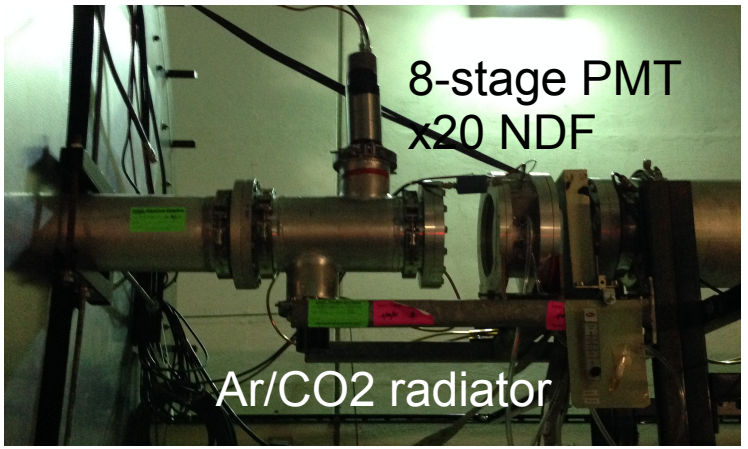
Spill Structure

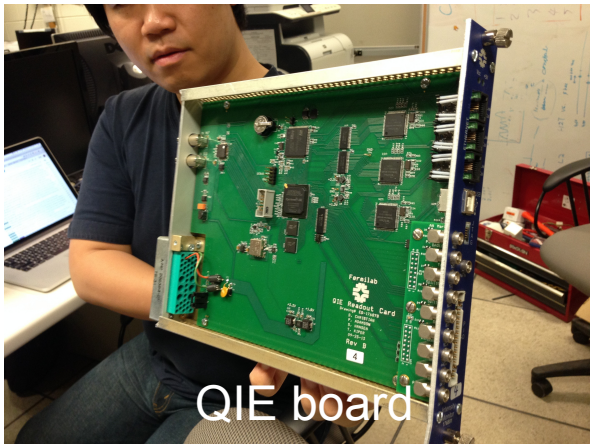
large **variations** in **instantaneous beam intensity** → high hit occupancy





beam-line Cherenkov monitor for beam diagnostics:



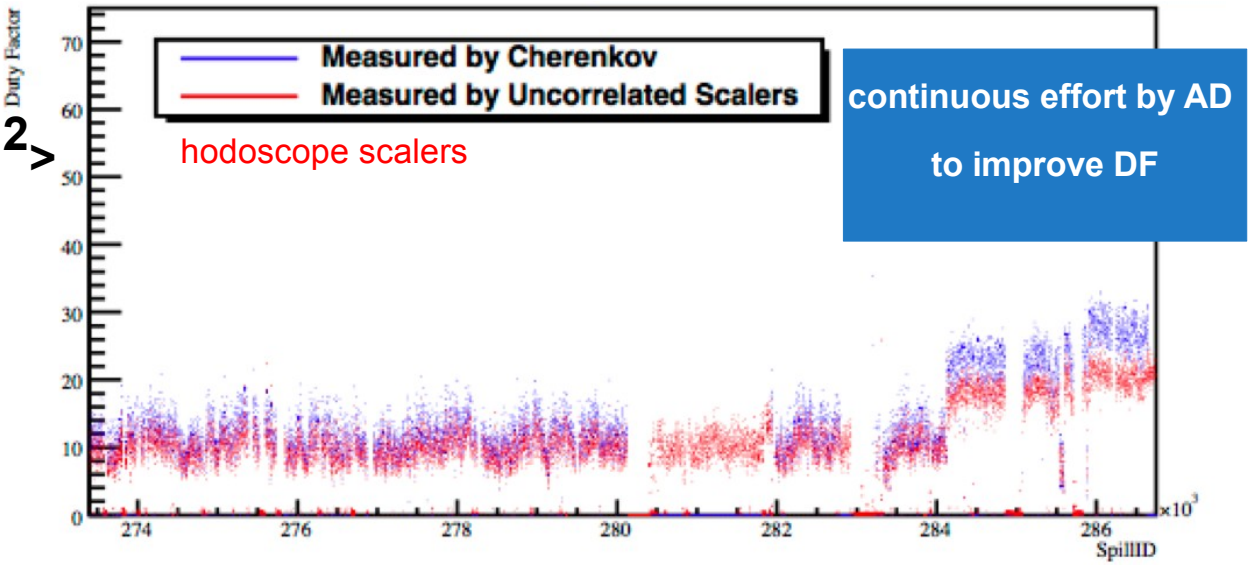


→ **beam diagnostics**: measurement of RF-bucket by RF-bucket intensity
→ **trigger inhibit**: veto on single RF buckets as a function of intensity,
½ beam inhibited due to 10x expected beam/RF-bucket

Duty Factor Measurements

– studying the uniformity of the beam

$DF = \langle I \rangle \langle I \rangle / \langle I^2 \rangle$



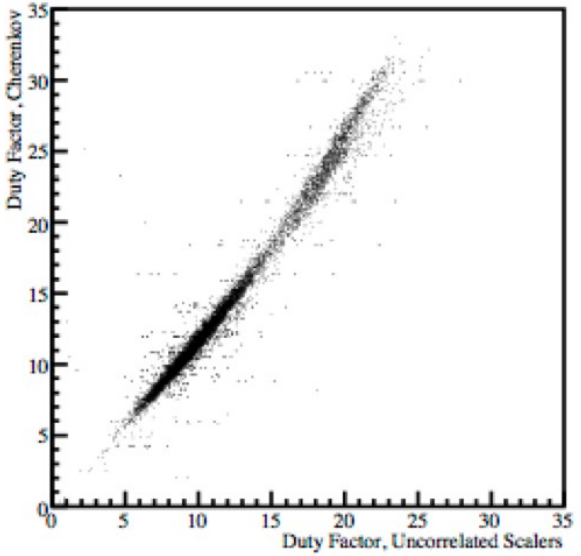
hodoscope scalers

continuous effort by AD to improve DF

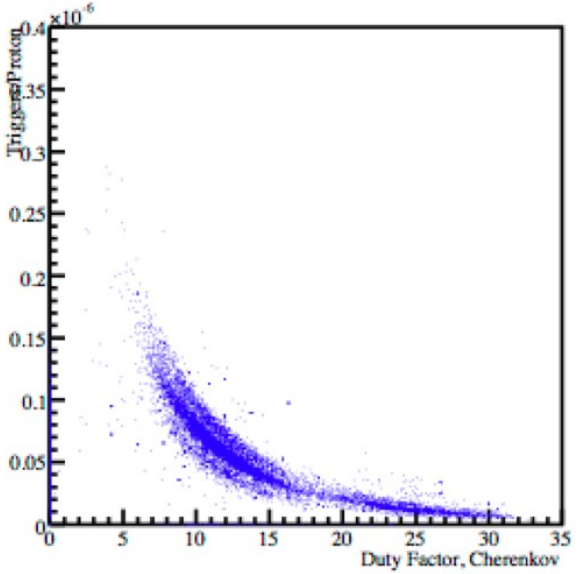
- confirmed that longitudinal quad damper improves DF
- increased RF voltage in MI during flattop
- test of feedback system installed to reduce 360Hz component in beam, might also reduce low frequency variations; RF voltage

DF measurements:

affected by saturation



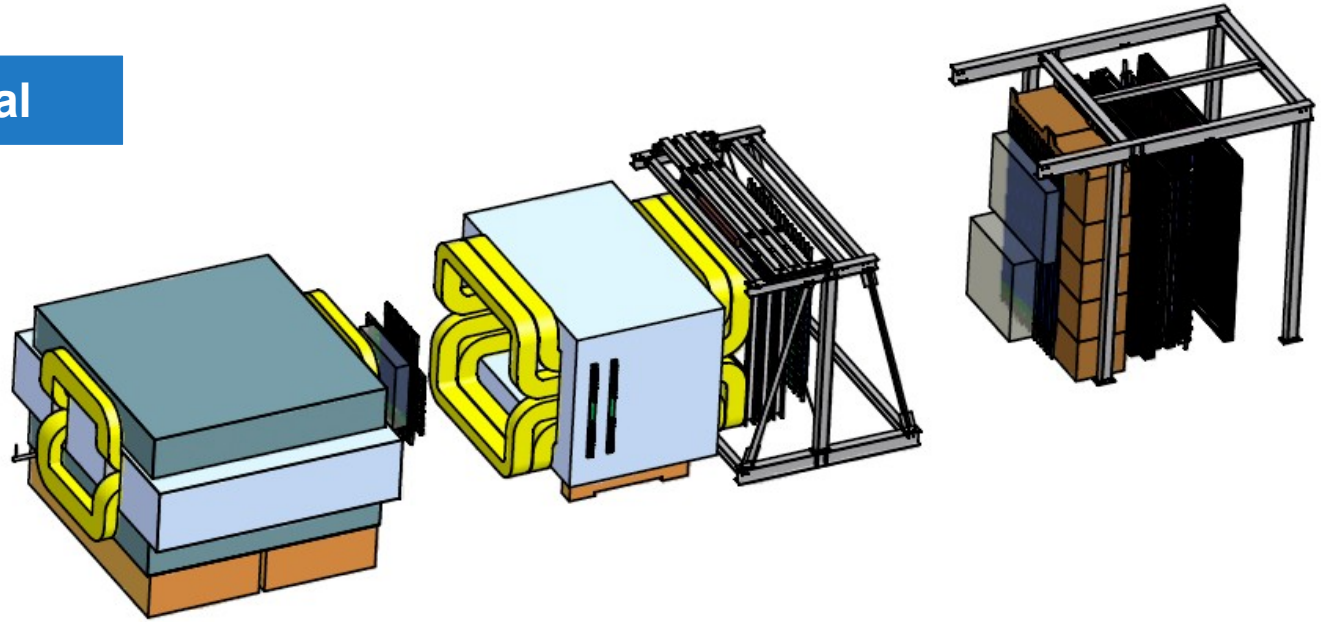
Trigger rate vs. DF:



based on real dimuon events,
affected by coincidence window and saturation

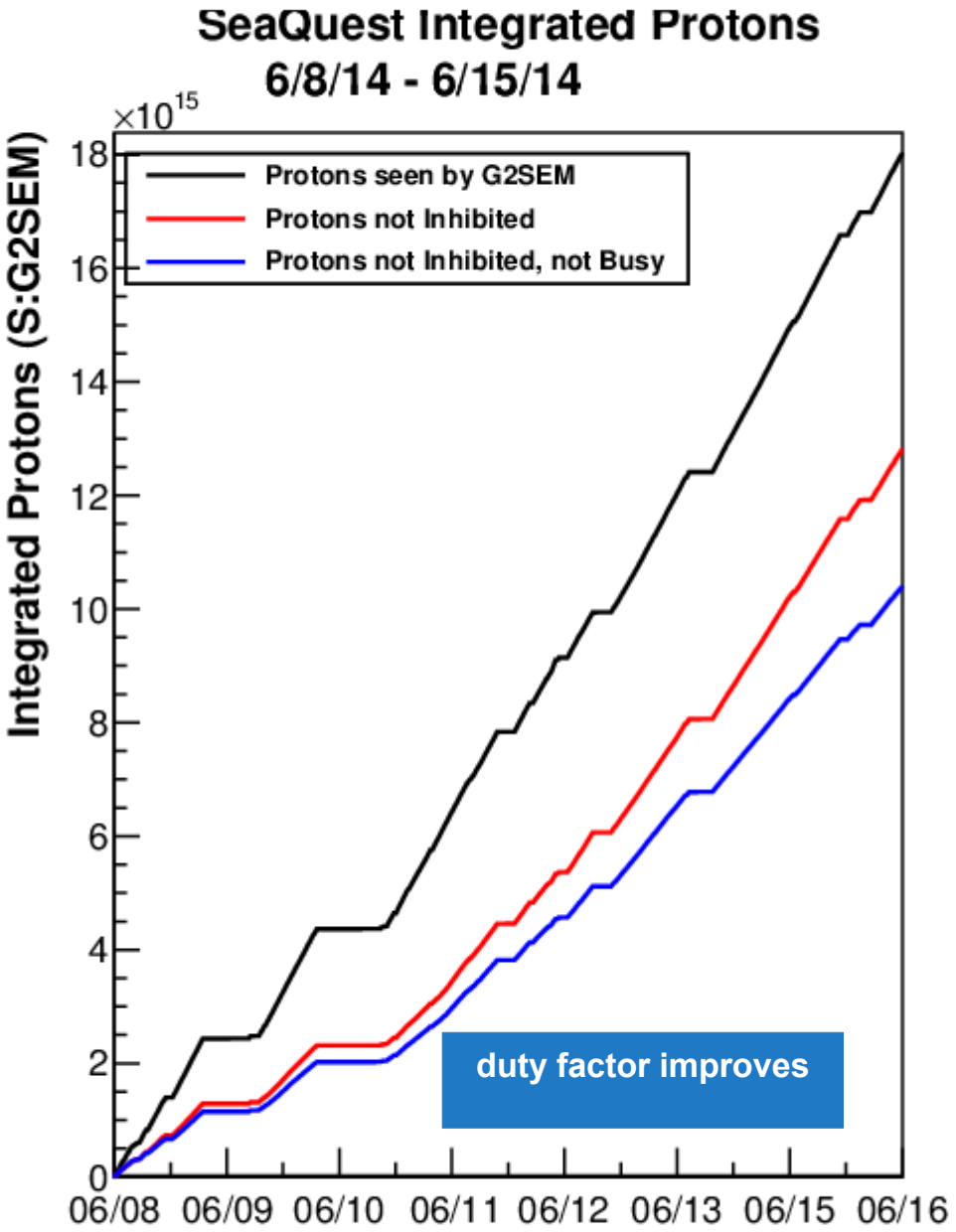
Spectrometer Status and Plans

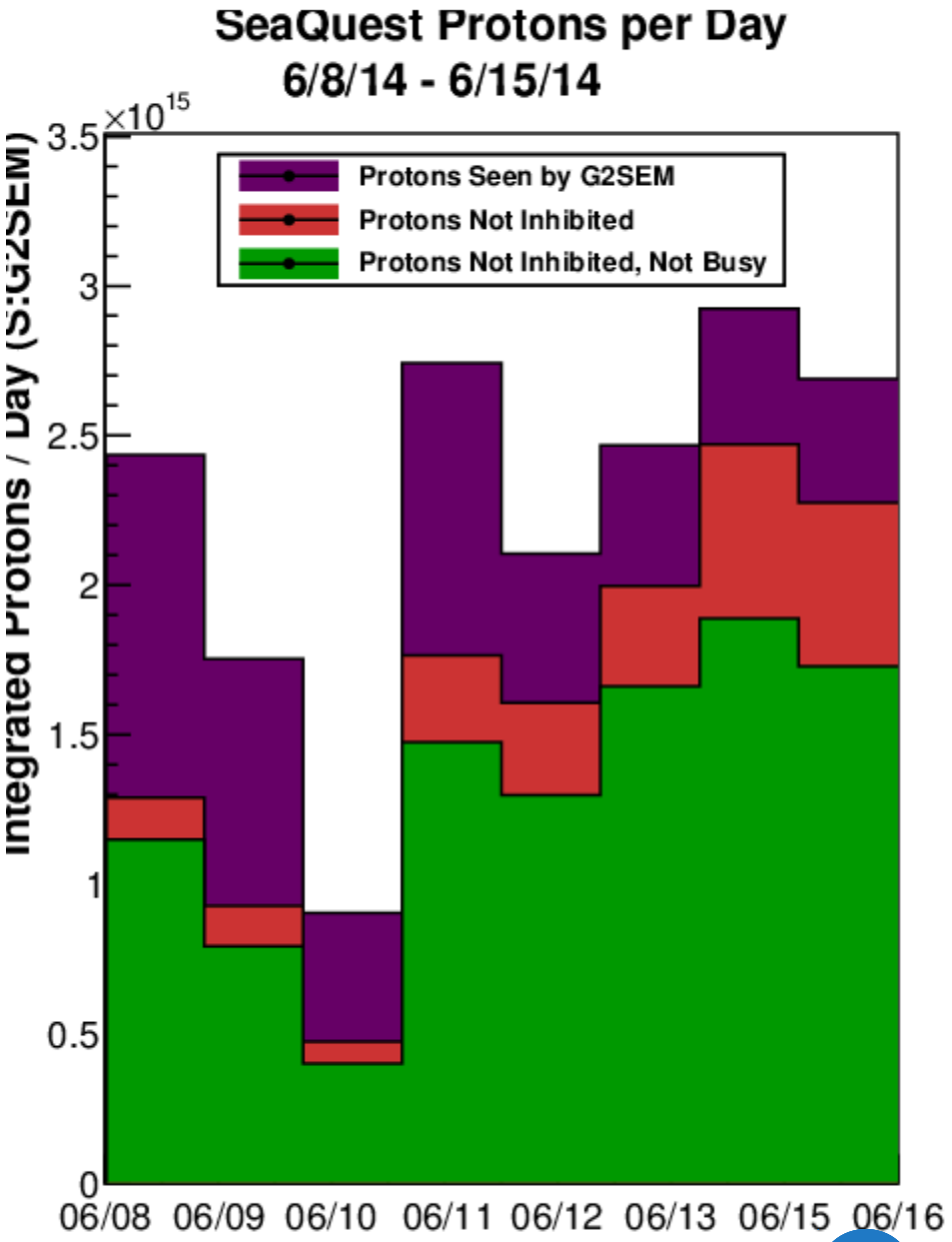
Operational



Target	liquid targets: H_2 and D_2, solid state targets: **C**, **Fe**, **W**; positions calibrated, ongoing issue of target position alerts (work in progress)
FMAG (2000A) **KMAG** (1600A)	operational, improved cooling, ongoing effort of bleeding air, precise magnetic field calibration (<1%))
Hodoscopes	timed in precisely (+/- 1ns), high efficiency, ongoing HV tuning (sagging?), well tested during trigger studies
Drift Chambers	operating stable (also at 2e12 ppp), high efficiency, electronics working well after the failure due to the power outage (see previous AEM presentation)
DAQ	continuous data taking, reduced DAQ dead time < 140us

Data Taking


SeaQuest Integrated Protons
6/8/14 - 6/15/14
×10^15
Integrated Protons (S:G2SEM)
Protons seen by G2SEM
Protons not Inhibited
Protons not Inhibited, not Busy
duty factor improves
0
2
4
6
8
10
12
14
16
18
06/08
06/09
06/10
06/11
06/12
06/13
06/15
06/16

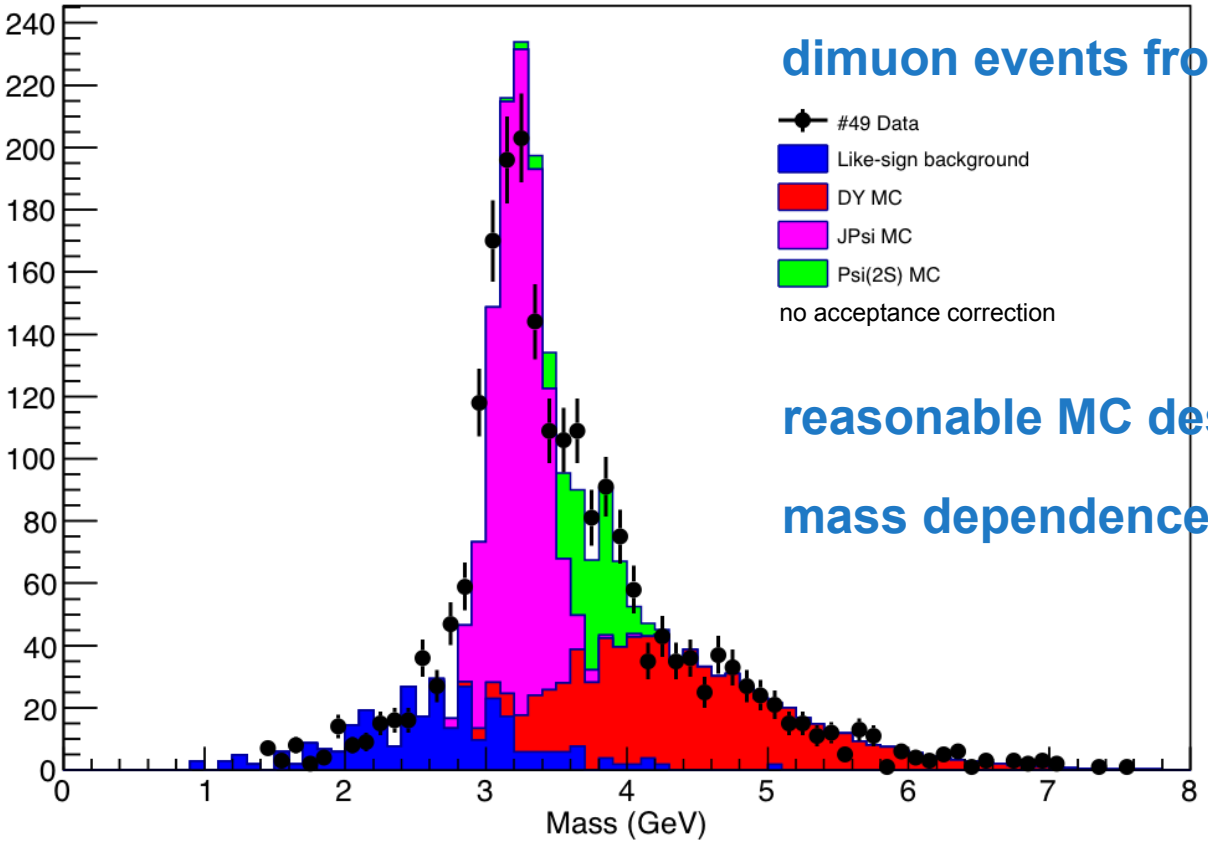

SeaQuest Protons per Day
6/8/14 - 6/15/14
×10^15
Integrated Protons / Day (S:G2SEM)
Protons Seen by G2SEM
Protons Not Inhibited
Protons Not Inhibited, Not Busy
0
0.5
1
1.5
2
2.5
3
3.5
06/08
06/09
06/10
06/11
06/12
06/13
06/15
06/16

Status of the Analysis

- data taking:

02/20	09/05	after fall shutdown
start of physics run	fall shutdown	continue physics run

- presentation of first preliminary physics results at DNP 2014
- **track and dimuon reconstruction** (from small data sample):



dimuon events from target (not dump)

reasonable MC description of the mass dependence of the acceptance