A SUMMARY ON POLARISATION IN RUN-12 FOR 255 GEV

E.C. ASCHENAUER
PRESENTING THE WORK DONE BY ALAN, ANDERS, BILL AND DIMA

BROOKHAVEN
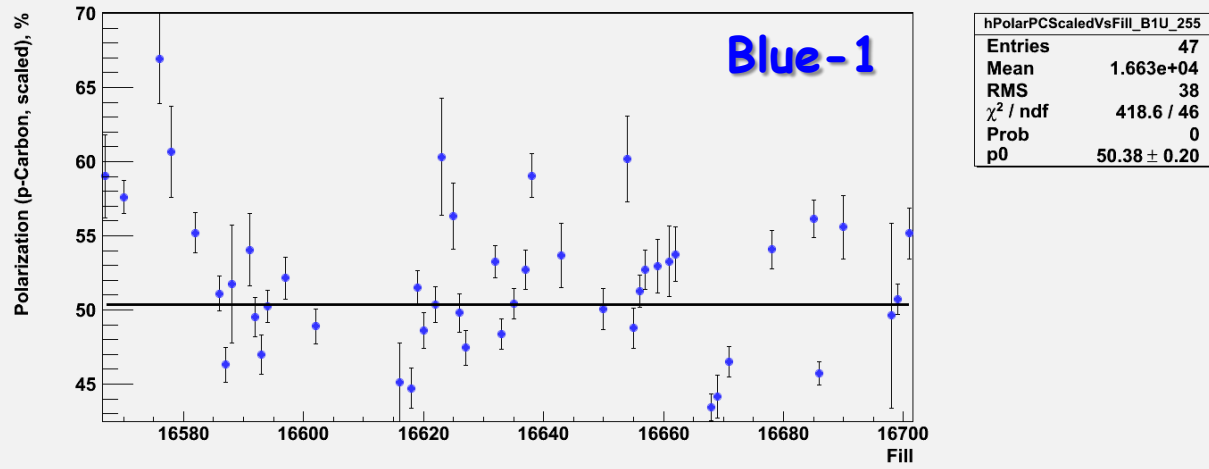NATIONAL LABORATORY

a passion for discovery
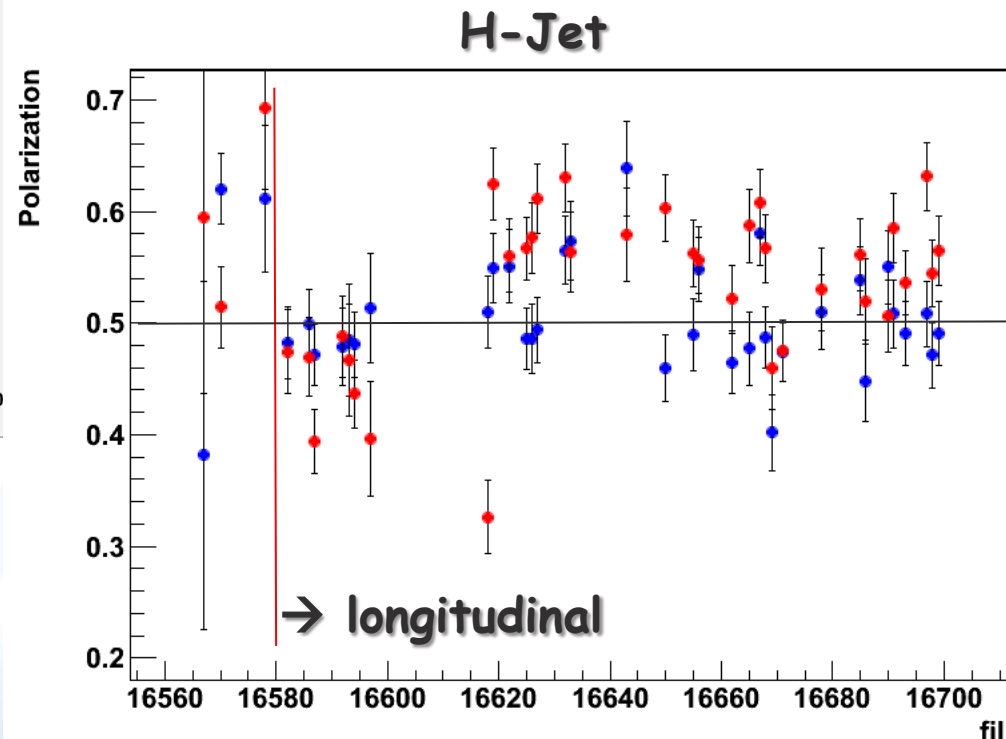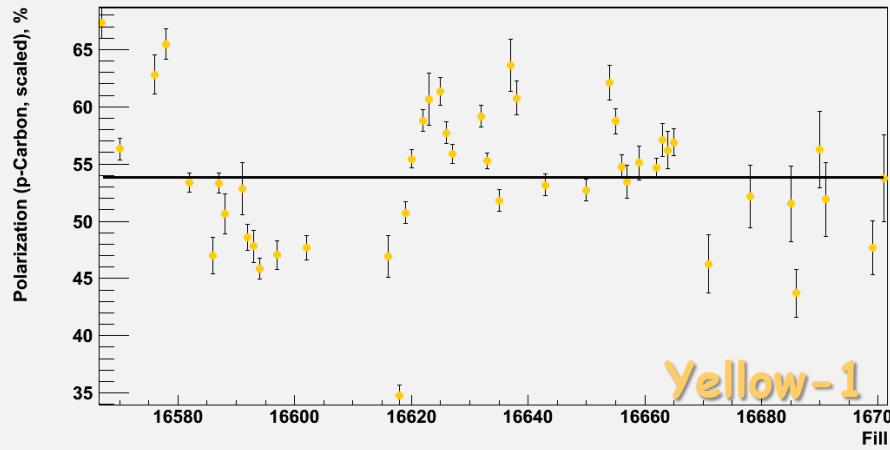
U.S. DEPARTMENT OF ENERGY | Office of Science

16701.101: Taken Tue Apr 10 06:07:08 2012, Analyzed Tue Apr 10 07:11:57 2012, Version 1719, dsmirnov

Blue-1

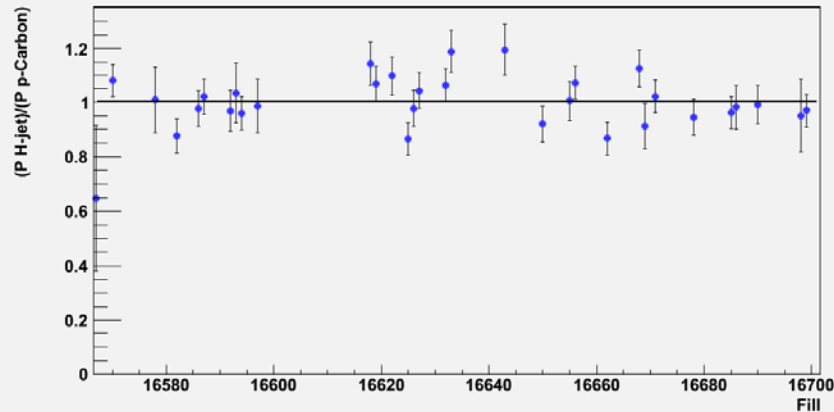| hPolarPCScaledVsFill_B1U_255	
Entries	47
Mean	1.663e+04
RMS	38
χ^2 / ndf	418.6 / 46
Prob	0
p0	50.38 ± 0.20

polarisation at flat top
Blue and Yellow

16701.101: Taken Tue Apr 10 06:07:08 2012, Analyzed Tue Apr 10 07:11:57 2012, Version 1719, dsmirnov

H-Jet

Yellow-1

→ longitudinal

E.C. Aschenauer

16701.101: Taken Tue Apr 10 06:07:08 2012, Analyzed Tue Apr 10 07:11:57 2012, Version 1719, dsmirnov

hNormJCVsFill_B1U_255	
Entries	4045
Mean	1.663e+04
RMS	38.96
χ^2 / ndf	45.74 / 31
Prob	0.04277
p0	1.003 ± 0.012

Blue-1: in good agreement with jet without normalisation

16701.101: Taken Tue Apr 10 06:07:08 2012, Analyzed Tue Apr 10 07:11:57 2012, Version 1719, dsmirnov
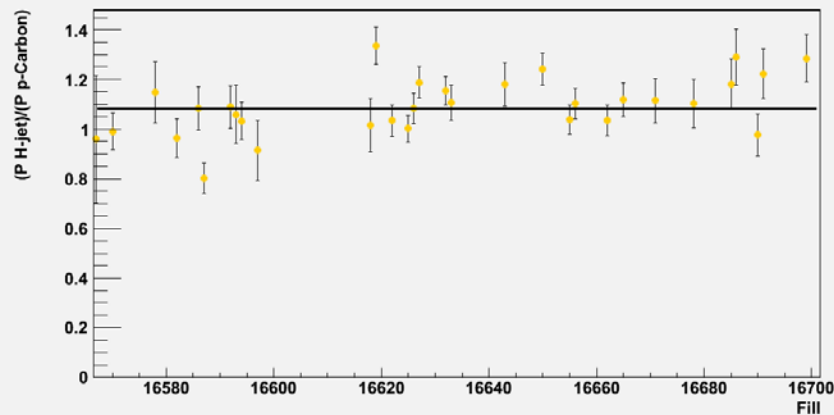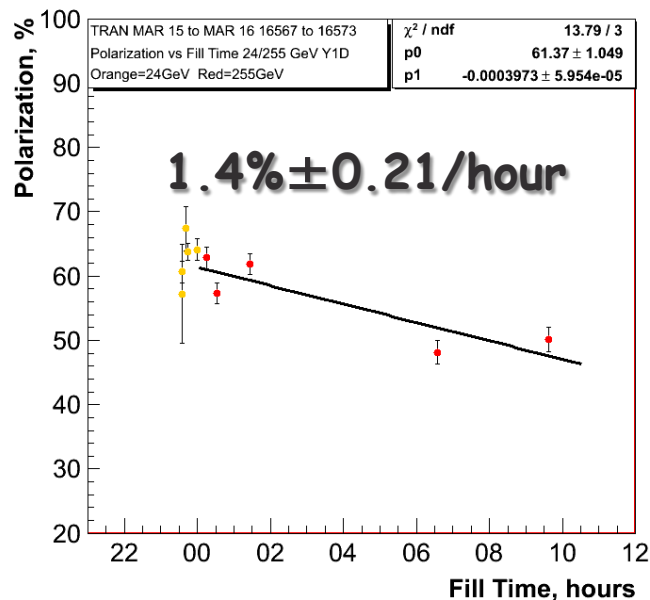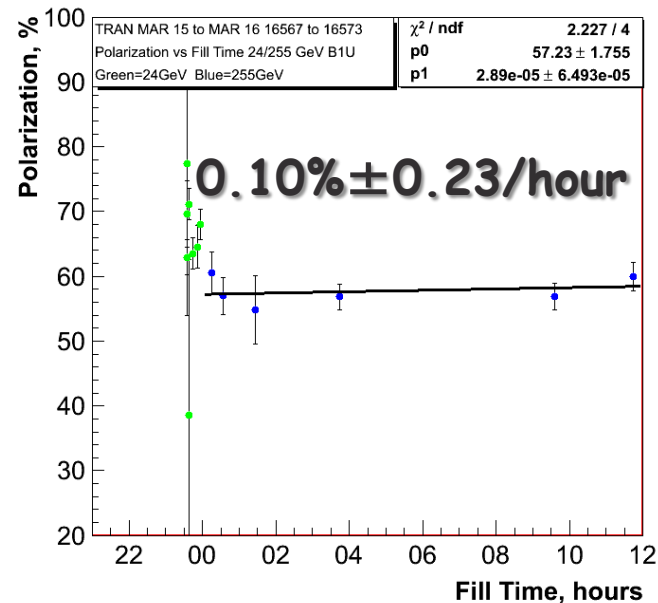
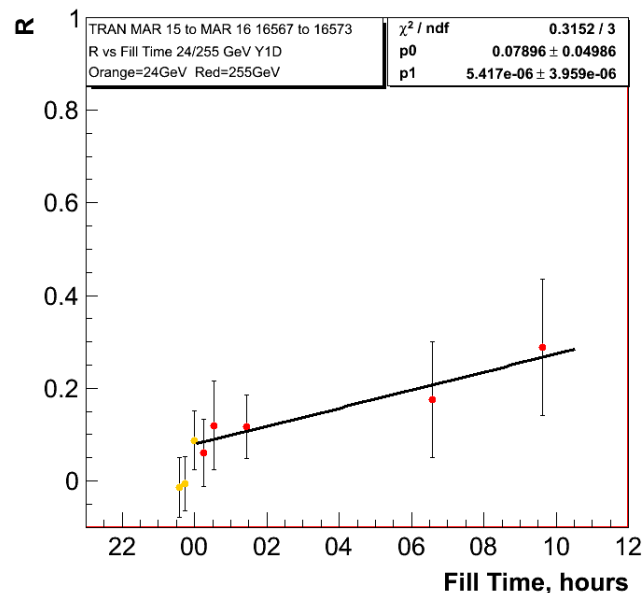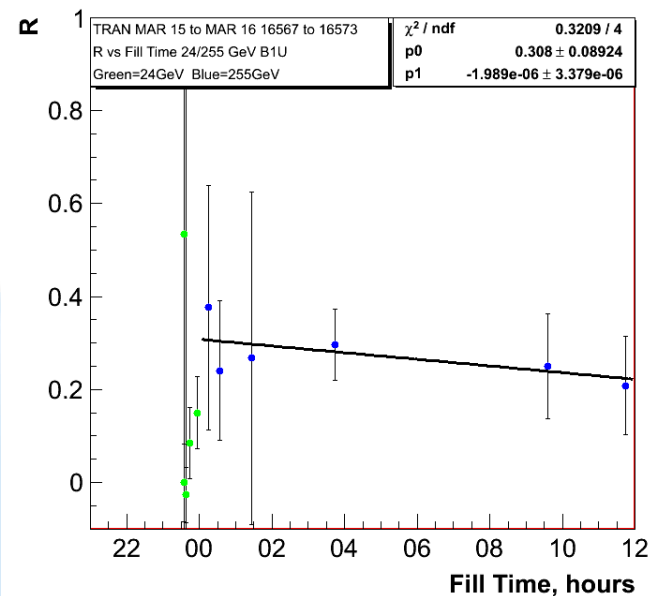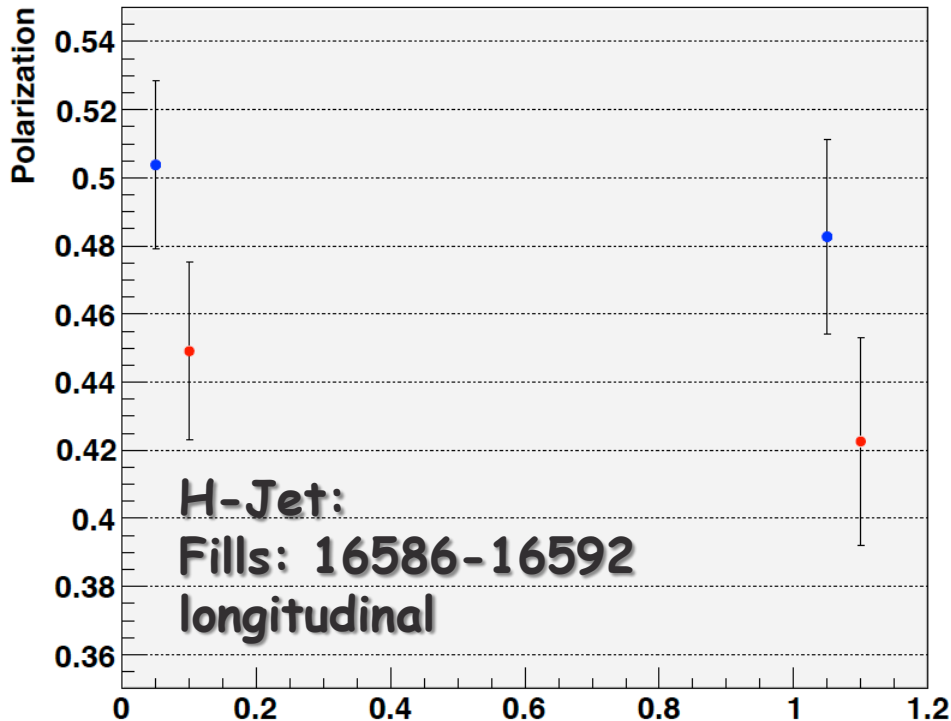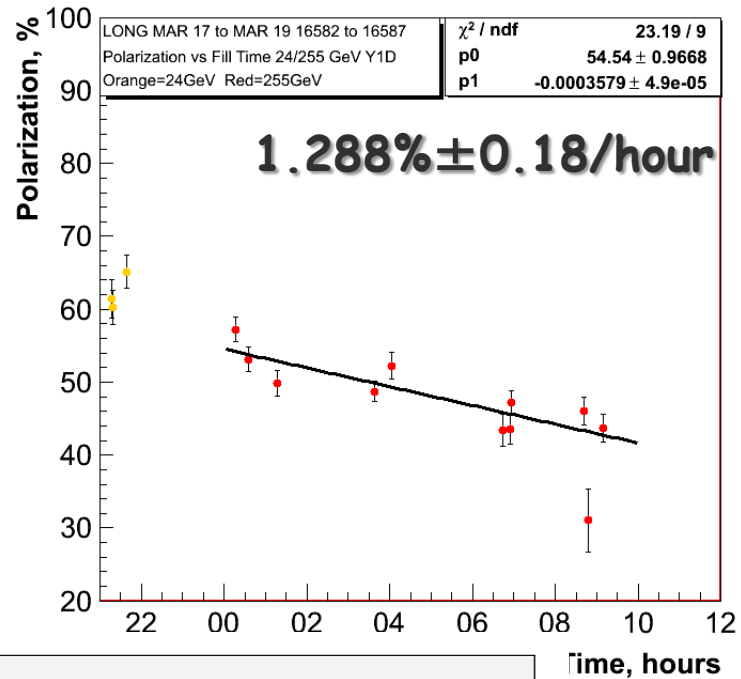| hNormJCVsFill_Y1D_255	
Entries	4108
Mean	1.663e+04
RMS	39.32
χ^2 / ndf	69.09 / 30
Prob	6.424e-05
p0	1.085 ± 0.014

Yellow-1: normalized by 1.08

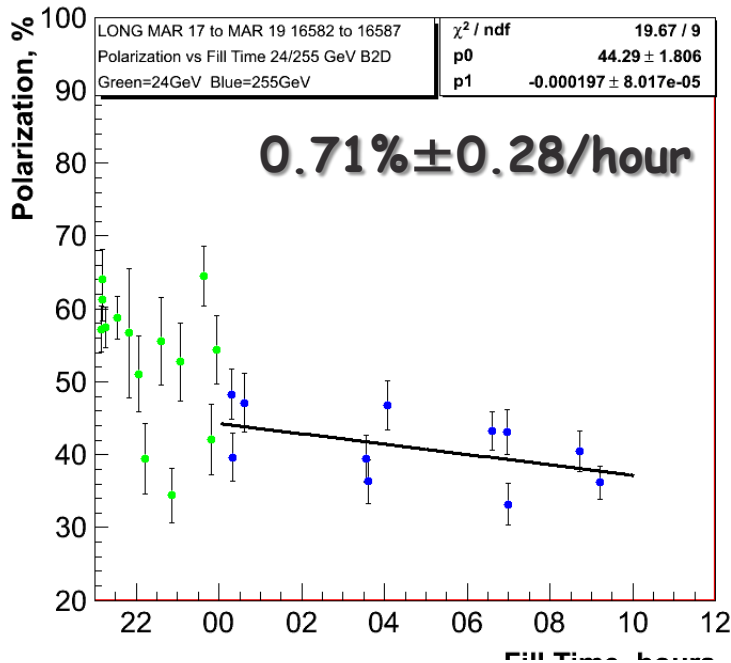**All measurements online and offline are normalized to jet now**
CDEV was reloaded with new offline numbers

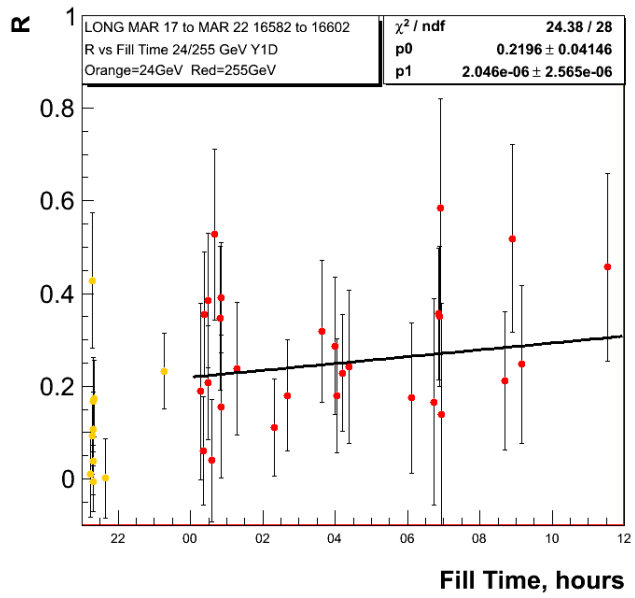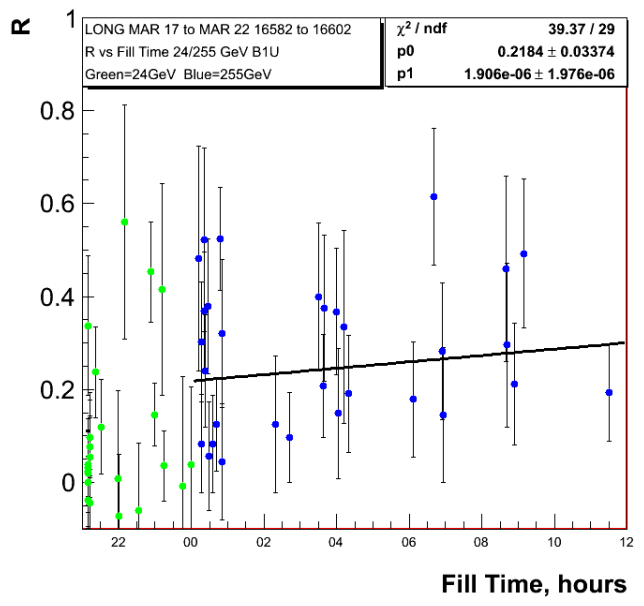Polarisation lifetime in yellow very similar to longitudinal 255 GeV fills

LONG MAR 17 to MAR 19 16582 to 16587
Polarization vs Fill Time 24/255 GeV B2D
Green=24GeV Blue=255GeV

χ^2 / ndf	19.67 / 9
p0	44.29 ± 1.806
p1	$-0.000197 \pm 8.017\text{e-}05$

0.71%±0.28/hour

LONG MAR 17 to MAR 19 16582 to 16587
Polarization vs Fill Time 24/255 GeV Y1D
Orange=24GeV Red=255GeV

χ^2 / ndf	23.19 / 9
p0	54.54 ± 0.9668
p1	$-0.0003579 \pm 4.9\text{e-}05$

1.288%±0.18/hour

H-Jet:
Fills: 16586-16592
longitudinal

5

BROOKHAVEN
NATIONAL LABORATORY

0.62%±0.13/hour

LONG MAR 17 to MAR 22 16582 to 16602
Polarization vs Fill Time 24/255 GeV B1U
Green=24GeV Blue=255GeV

χ² / ndf	80.44 / 29
p0	52.62 ± 0.6742
p1	-0.0001748 ± 3.626e-05

0.9%±0.11/hour

LONG MAR 17 to MAR 22 16582 to 16602
Polarization vs Fill Time 24/255 GeV Y1D
Orange=24GeV Red=255GeV

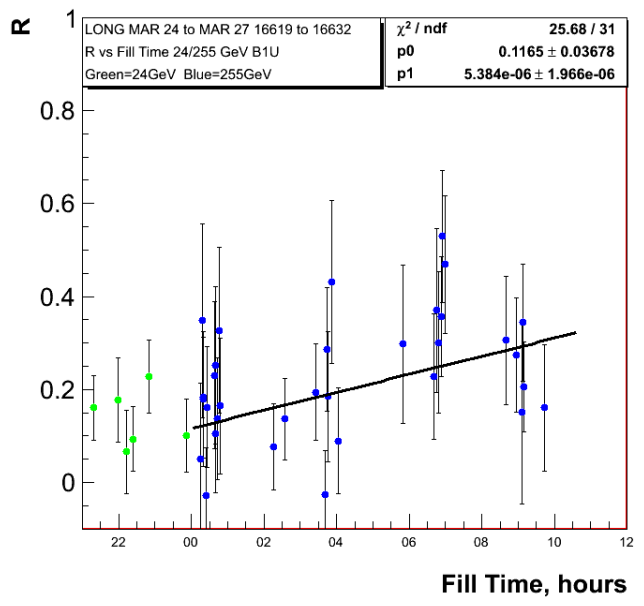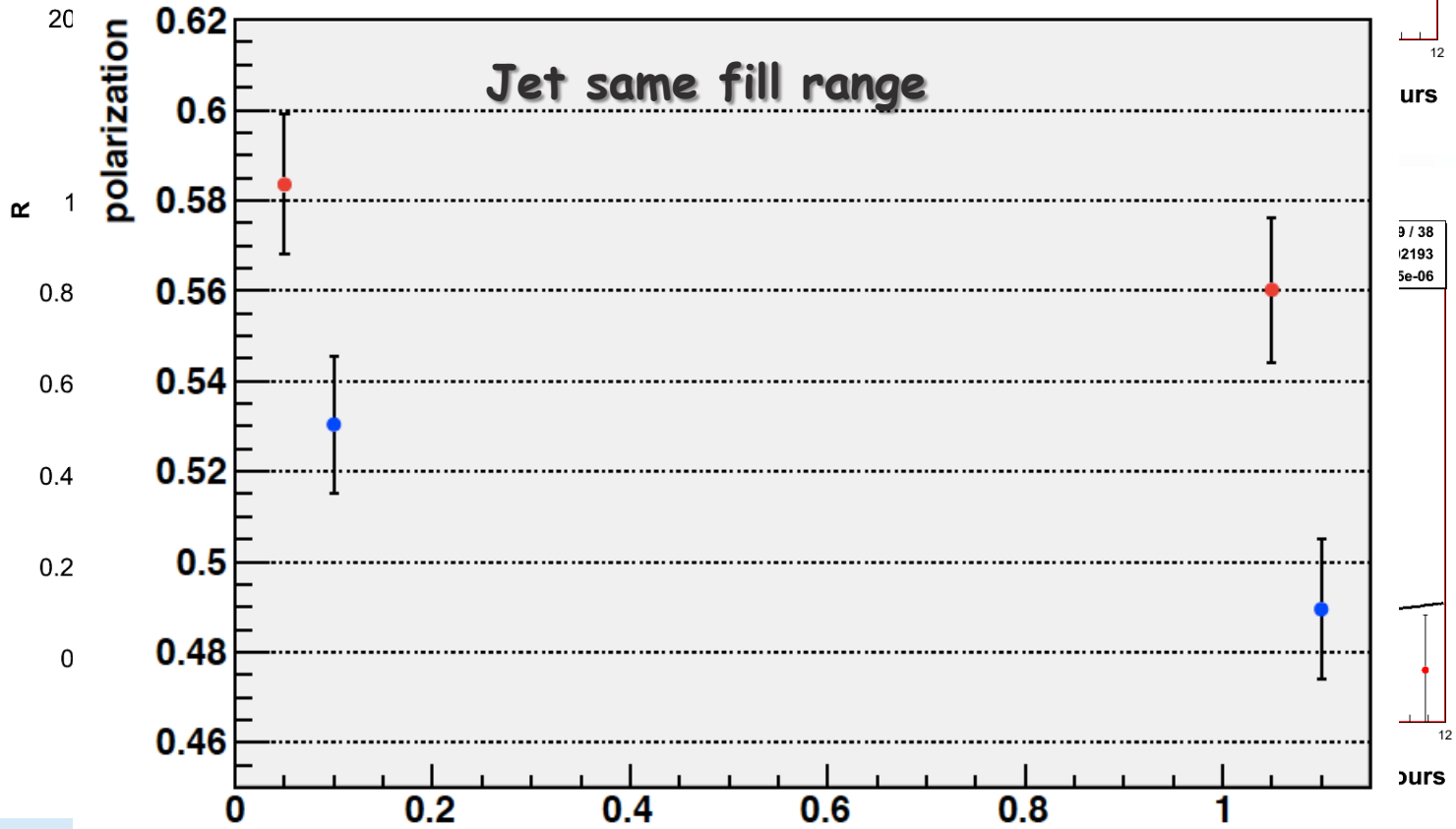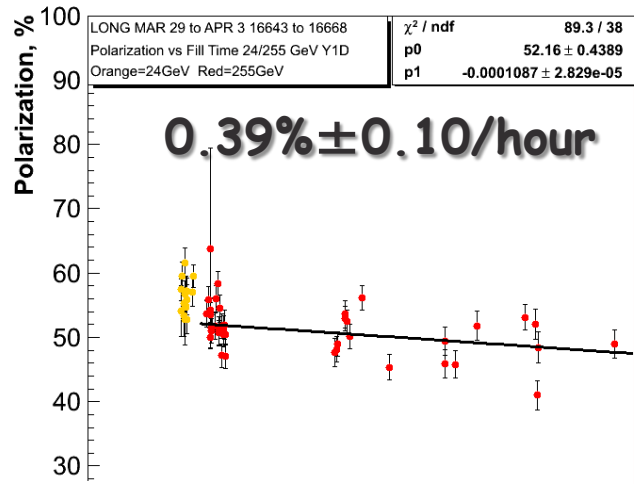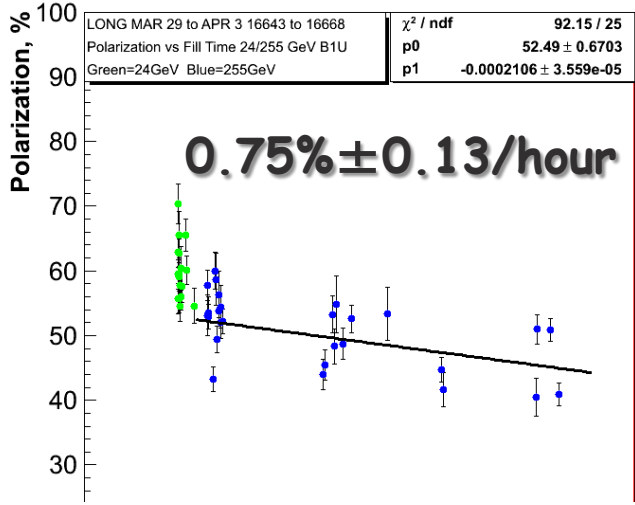| χ² / ndf	128.3 / 28
p0	49.3 ± 0.5523
p1	-0.0002504 ± 3.056e-05

Polarisation lifetime very similar run-11 and run-12 so 255 GeV did not do the trick

LONG MAR 17 to MAR 22 16582 to 16602
R vs Fill Time 24/255 GeV B1U
Green=24GeV Blue=255GeV

χ² / ndf	39.37 / 29
p0	0.2184 ± 0.03374
p1	1.906e-06 ± 1.976e-06

LONG MAR 17 to MAR 22 16582 to 16602
R vs Fill Time 24/255 GeV Y1D
Orange=24GeV Red=255GeV

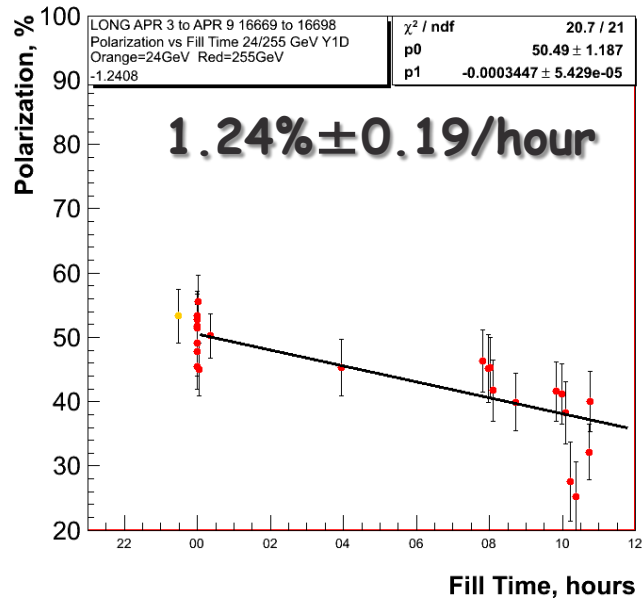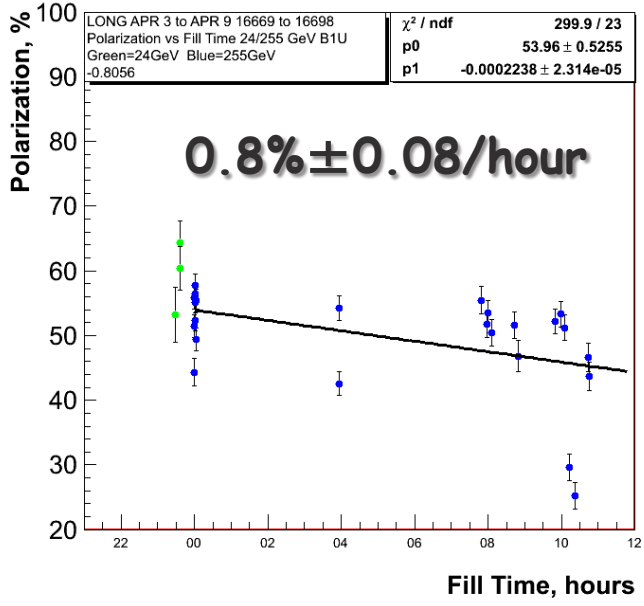| χ² / ndf	24.38 / 28
p0	0.2196 ± 0.04146
p1	2.046e-06 ± 2.565e-06
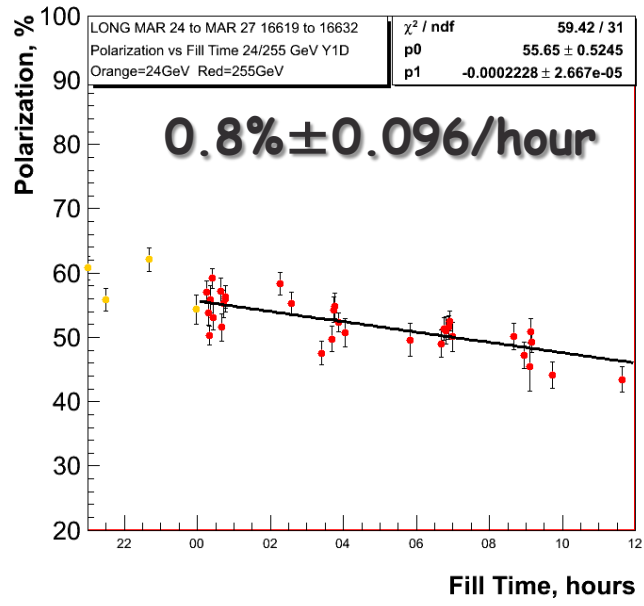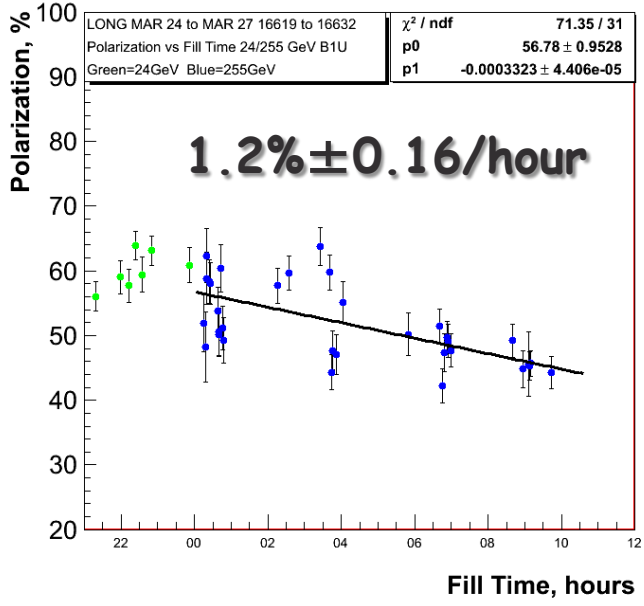
Polarisation Lifetime for low Emittance fills

1.2%±0.16/hour

0.8%±0.096/hour

0.75%±0.13/hour

0.39%±0.10/hour

Jet same fill range
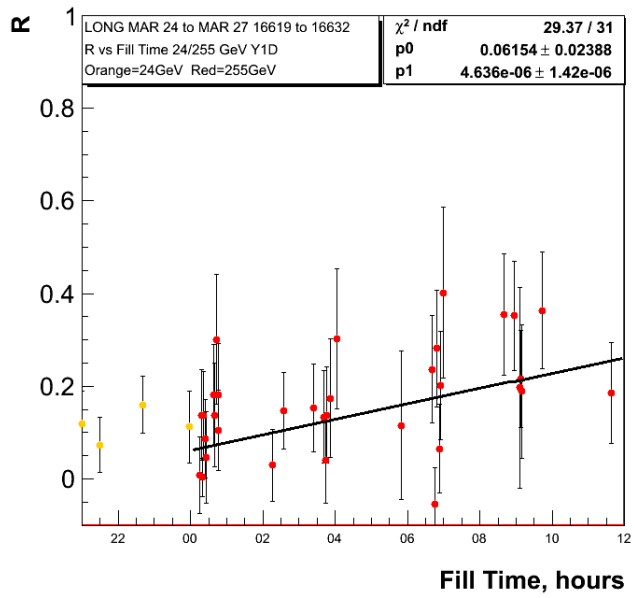
Polarisation Lifetime since last week

0.8%±0.08/hour

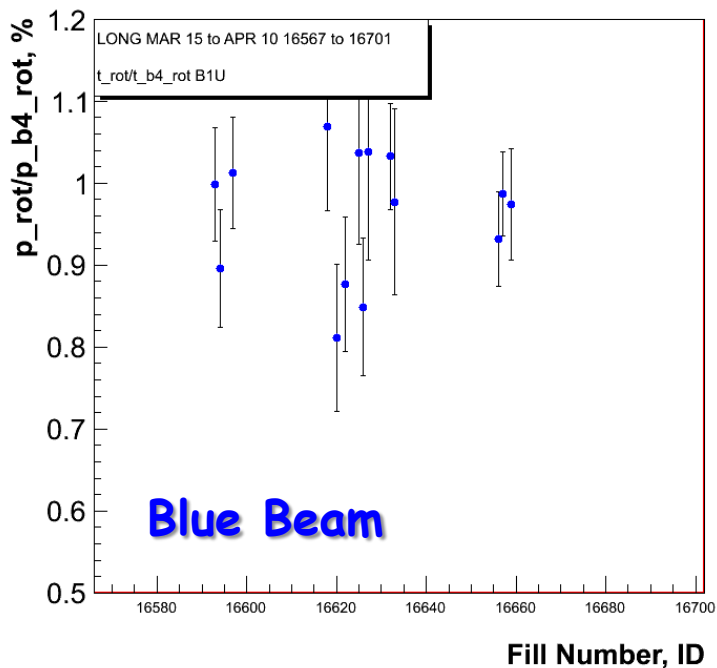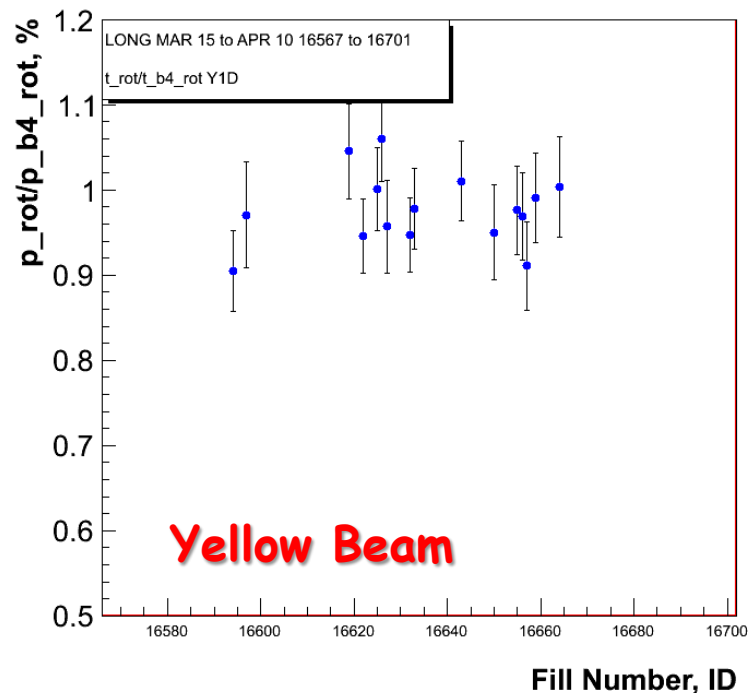1.24%±0.19/hour
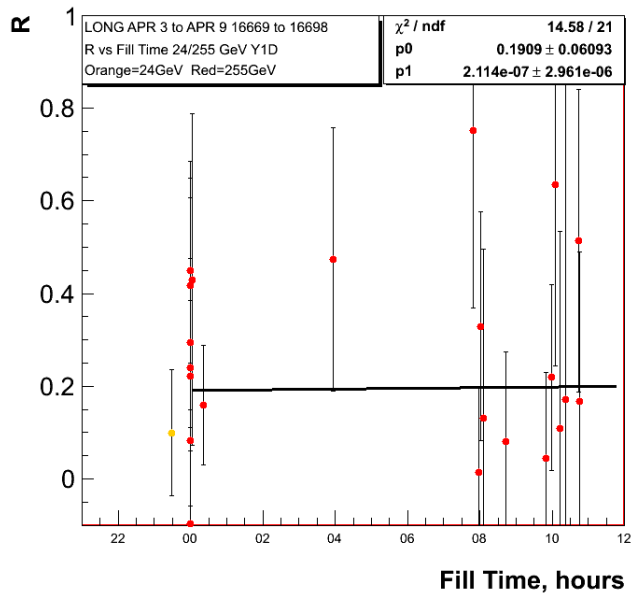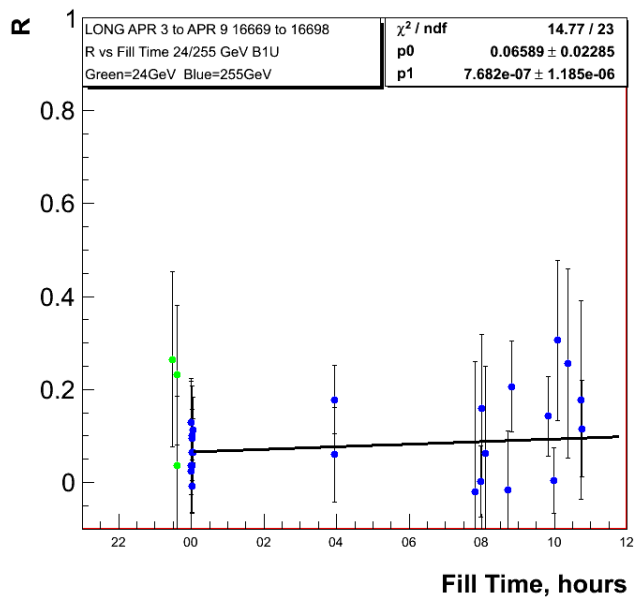
Shown is the ratio of the polarisation measurements before and after the rotator ramp at 255 GeV

- ❑ Reinstall new target in Blue and Yellow on Wednesday
- ❑ Work on RHIC AGS injection measurement comparisons and loss on the ramp
- ❑ After that should go back to normal measurement routine
  - ➢ measure at injection
  - ➢ before and after rotator ramp
  - ➢ in the middle of the fill ← only this impacts PHENIX
  - ➢ at the end of the fill
- ❑ Have a scheme how to provide to the experiments a polarisation, which allows to calculate for each trigger the correct luminosity weighted, polarisation profile corrected and to the jet normalized value
  - ➢ might apply it also 2011 data and
  - ➢ investigate it for 2009 100 GeV