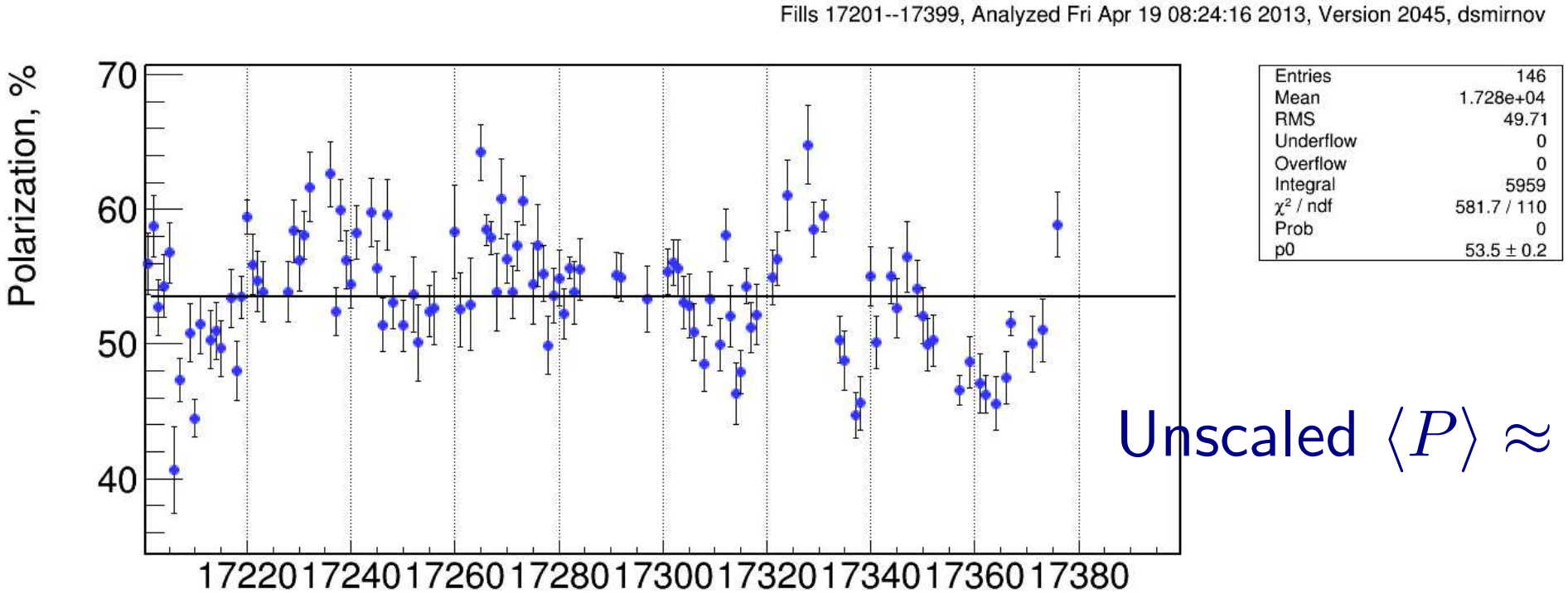
p-Carbon RHIC Polarimeters Status Report

Dmitri Smirnov

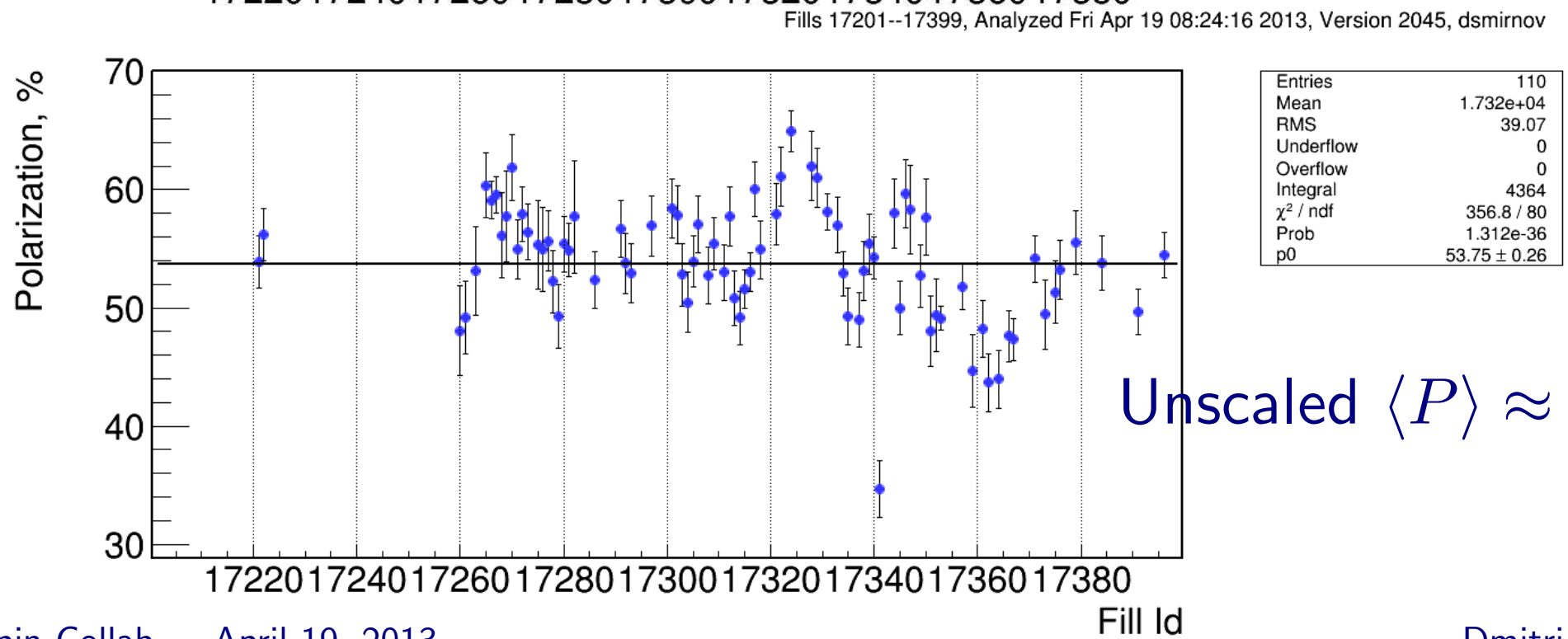
for the CNI polarimetry group

April 19, 2013

pC Polarimeters in Blue, Injection $E_{\text{beam}} = 24$ GeV

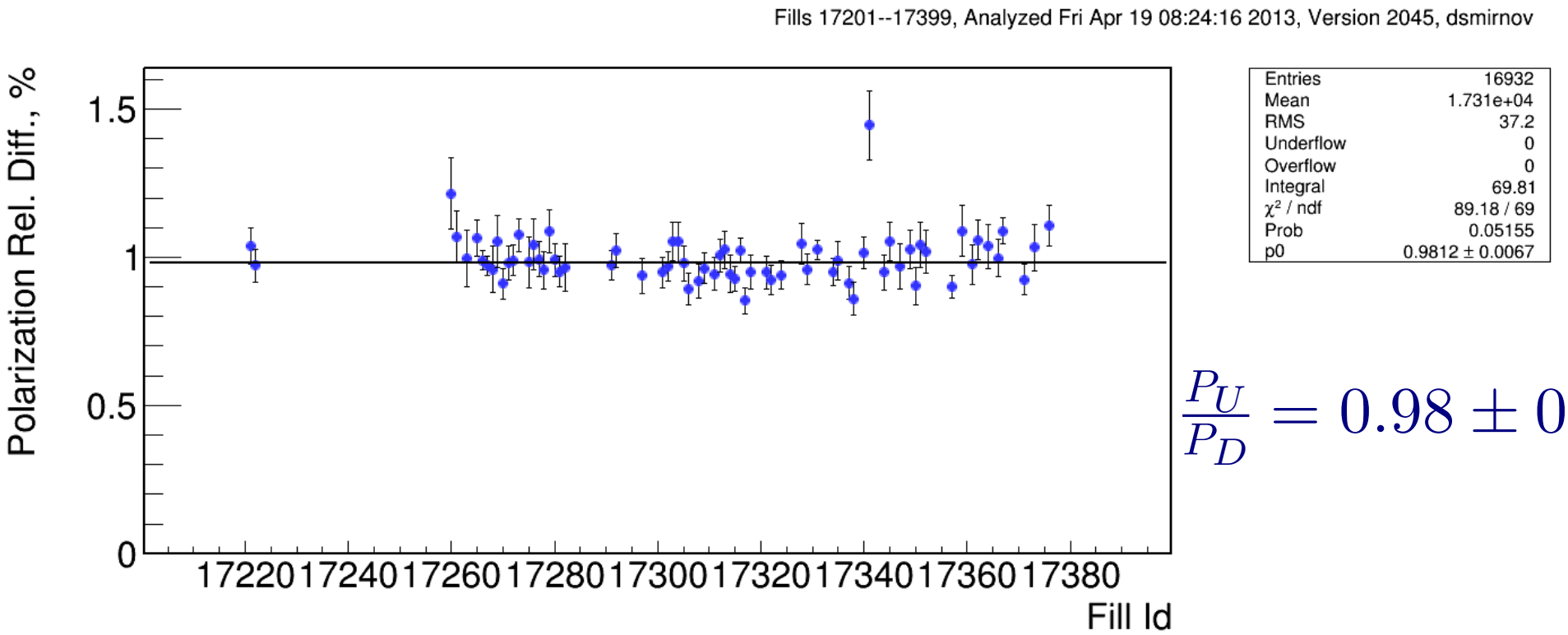


Unscaled $\langle P \rangle \approx 54\%$



Unscaled $\langle P \rangle \approx 54\%$

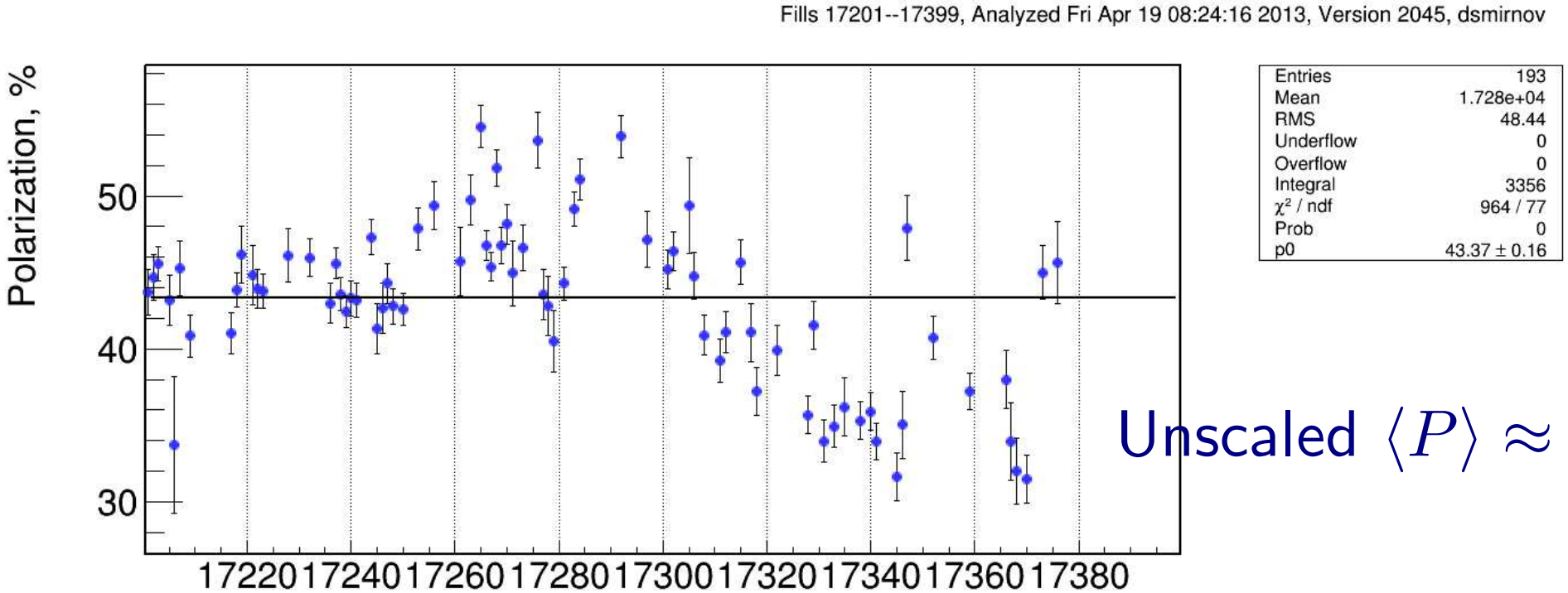
B1U/B2D Consistency, Injection $E_{\text{beam}} = 24$ GeV



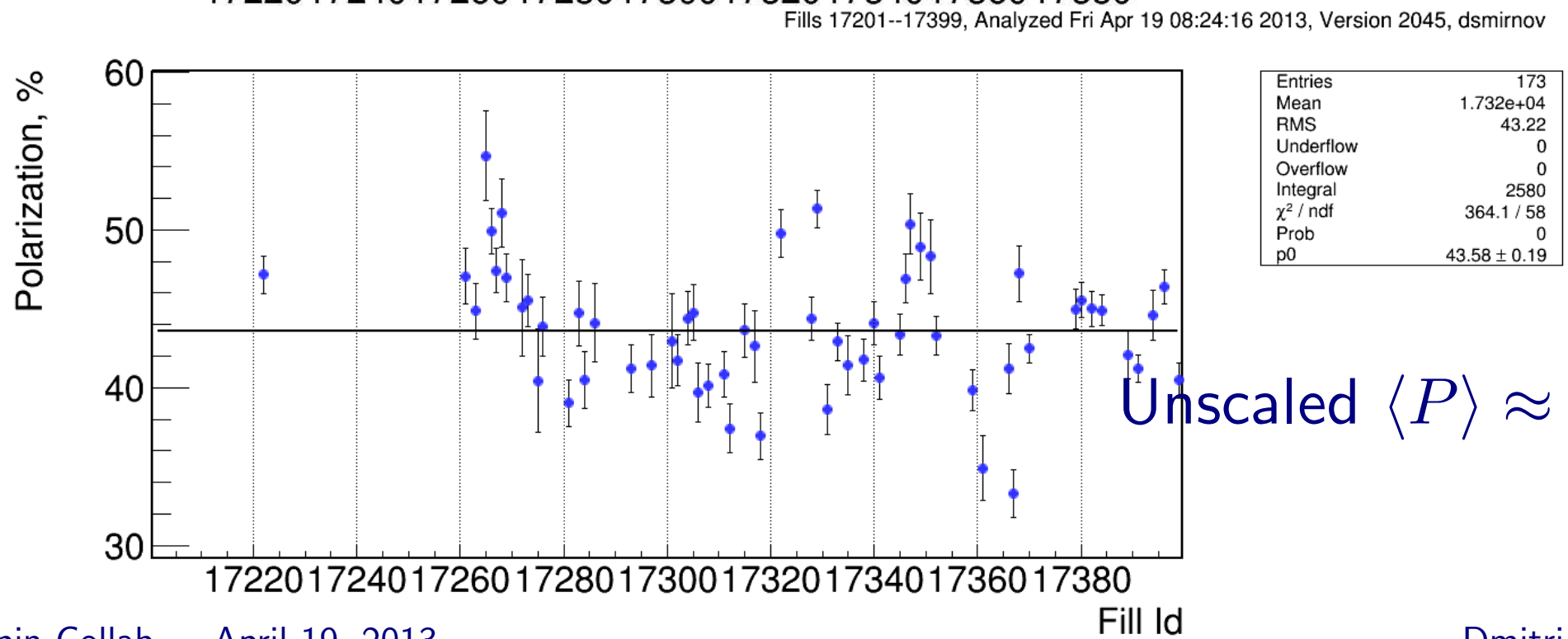
$$\frac{P_U}{P_D} = 0.98 \pm 0.01$$

- Both polarimeters agree very well at injection

pC Polarimeters in Blue, Flattop $E_{\text{beam}} = 255$ GeV

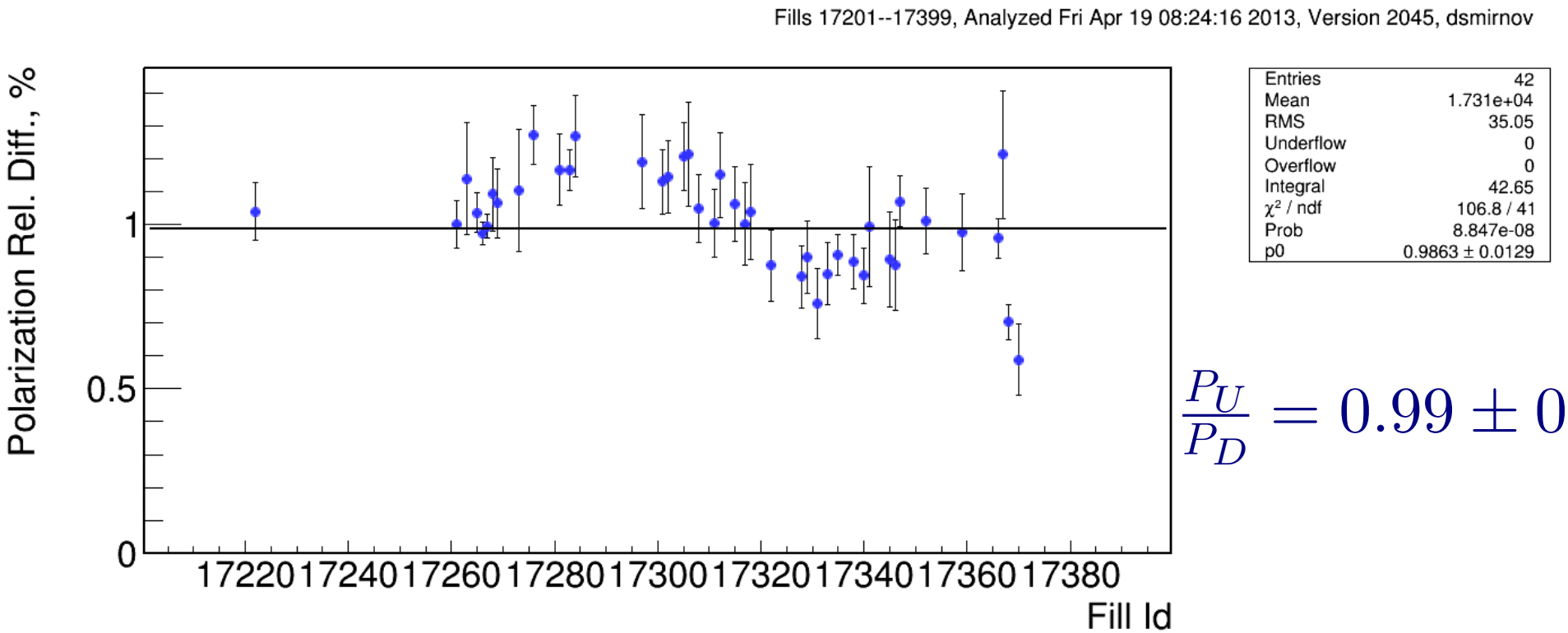


Unscaled $\langle P \rangle \approx 43\%$



Unscaled $\langle P \rangle \approx 44\%$

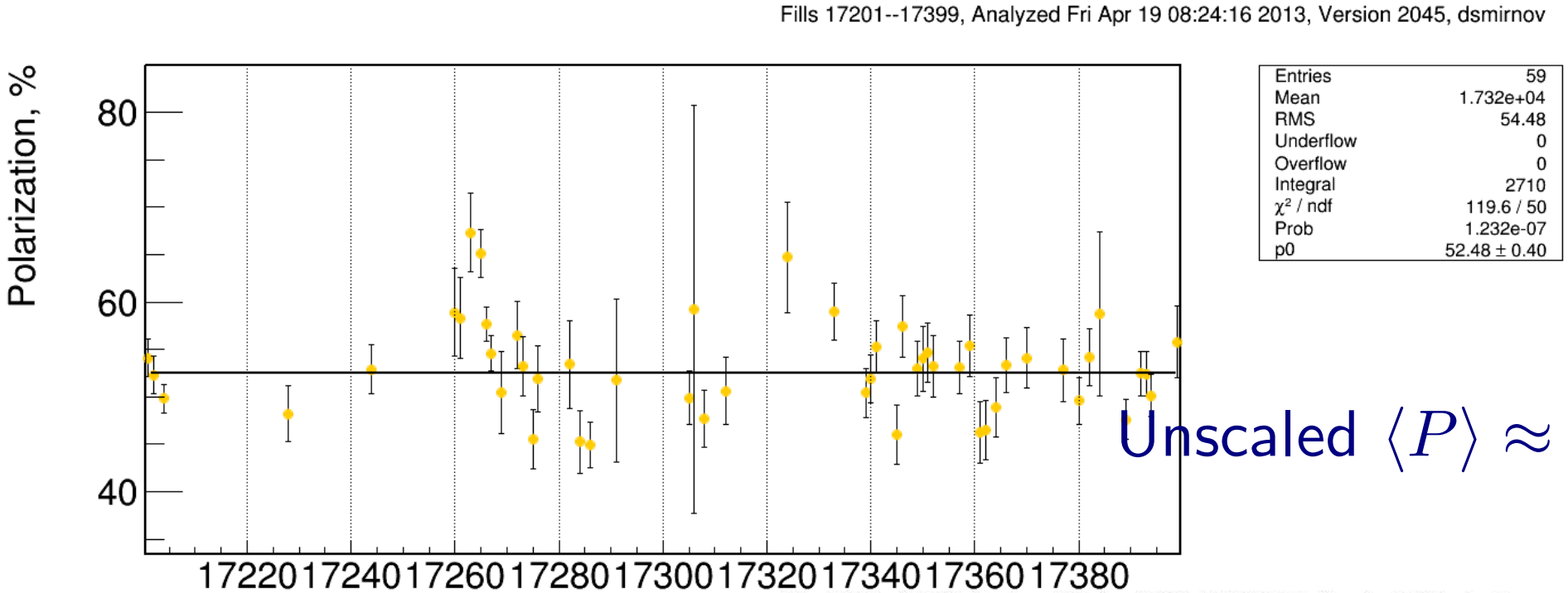
B1U/B2D Consistency, Flattop $E_{\text{beam}} = 255$ GeV



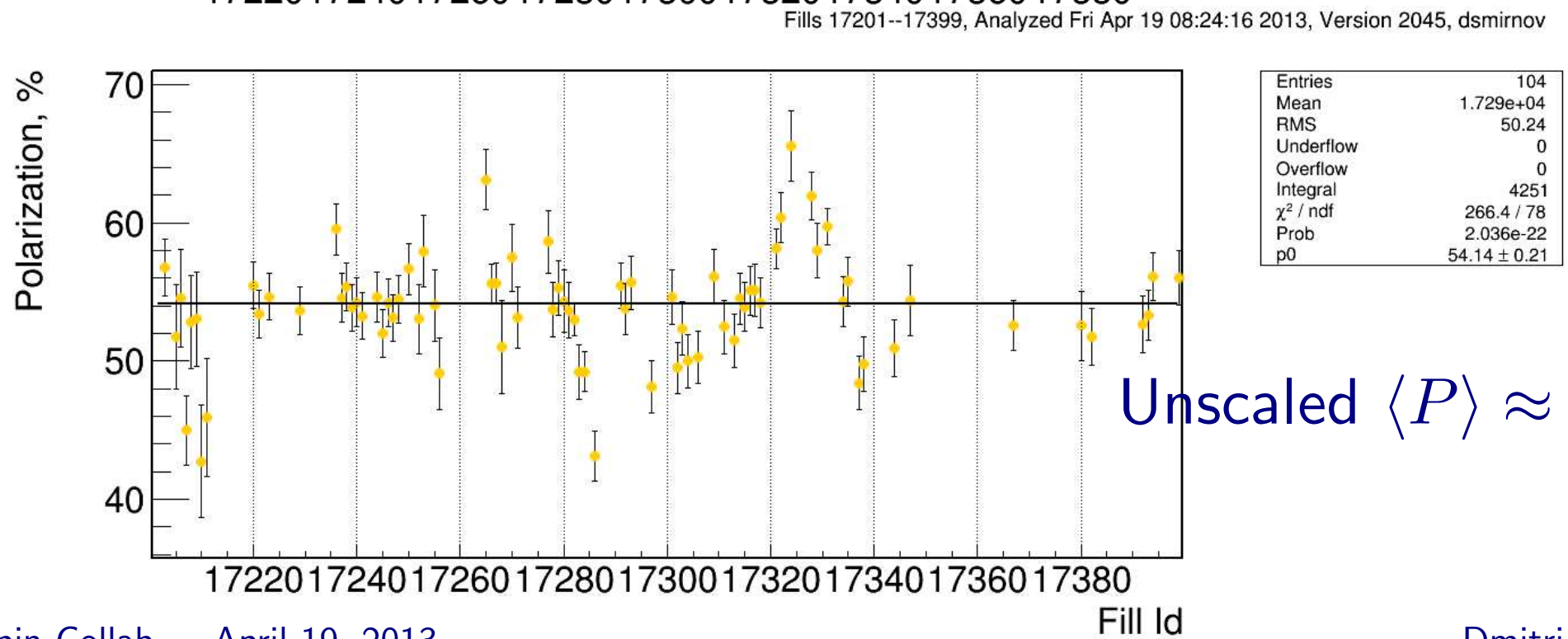
$$\frac{P_U}{P_D} = 0.99 \pm 0.01$$

- B1 and B2 do not agree well at flattop energies
  - Do not observe obvious noise problems in the detectors
  - Targets are same as at injection . . .
  - Investigating changing detector gains . . .

pC Polarimeters in Yellow, Injection $E_{\text{beam}} = 24$ GeV

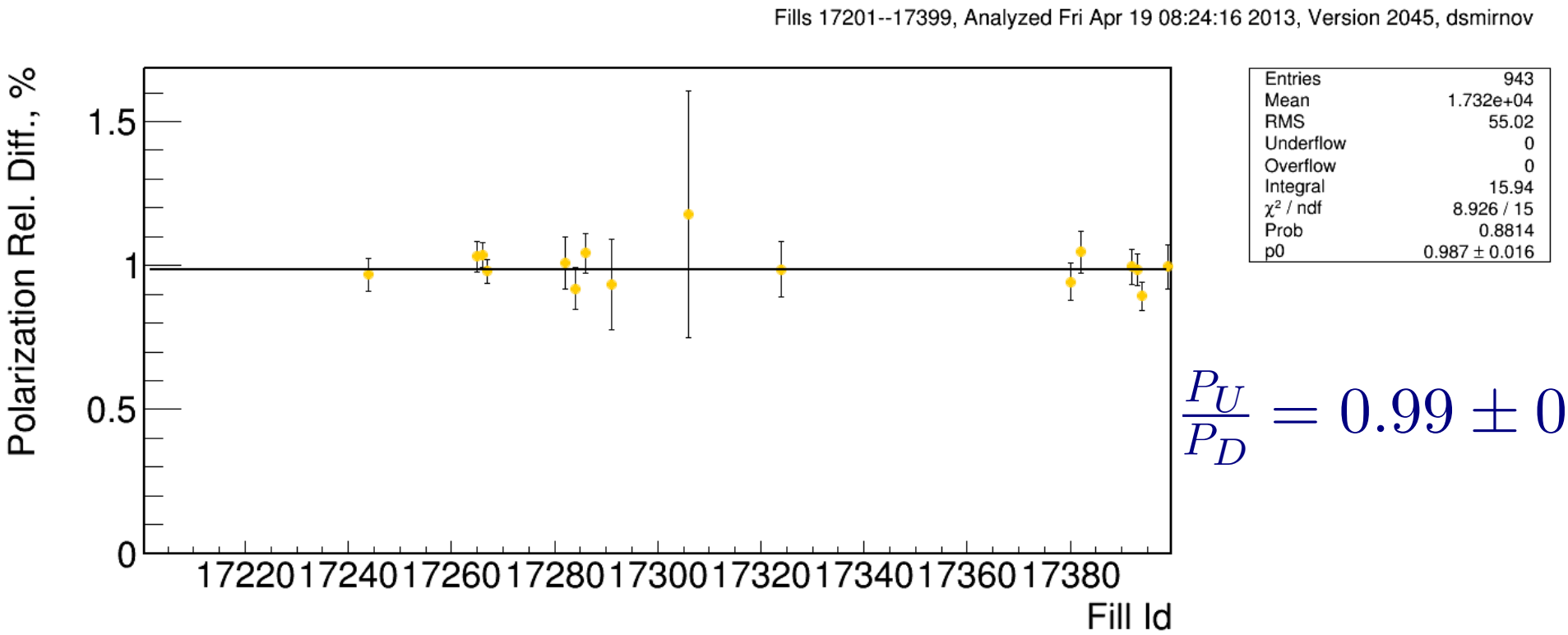


Unscaled $\langle P \rangle \approx 53\%$



Unscaled $\langle P \rangle \approx 54\%$

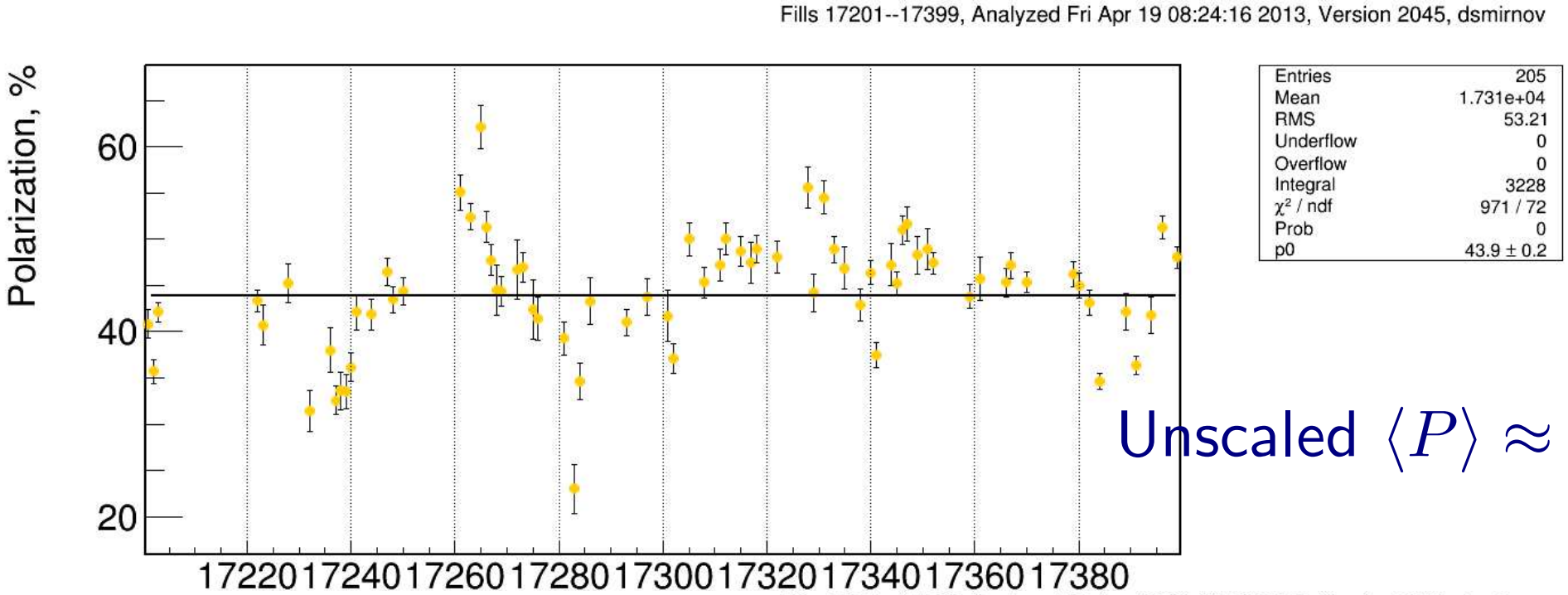
Y2U/Y1D Consistency, Injection $E_{\text{beam}} = 24$ GeV



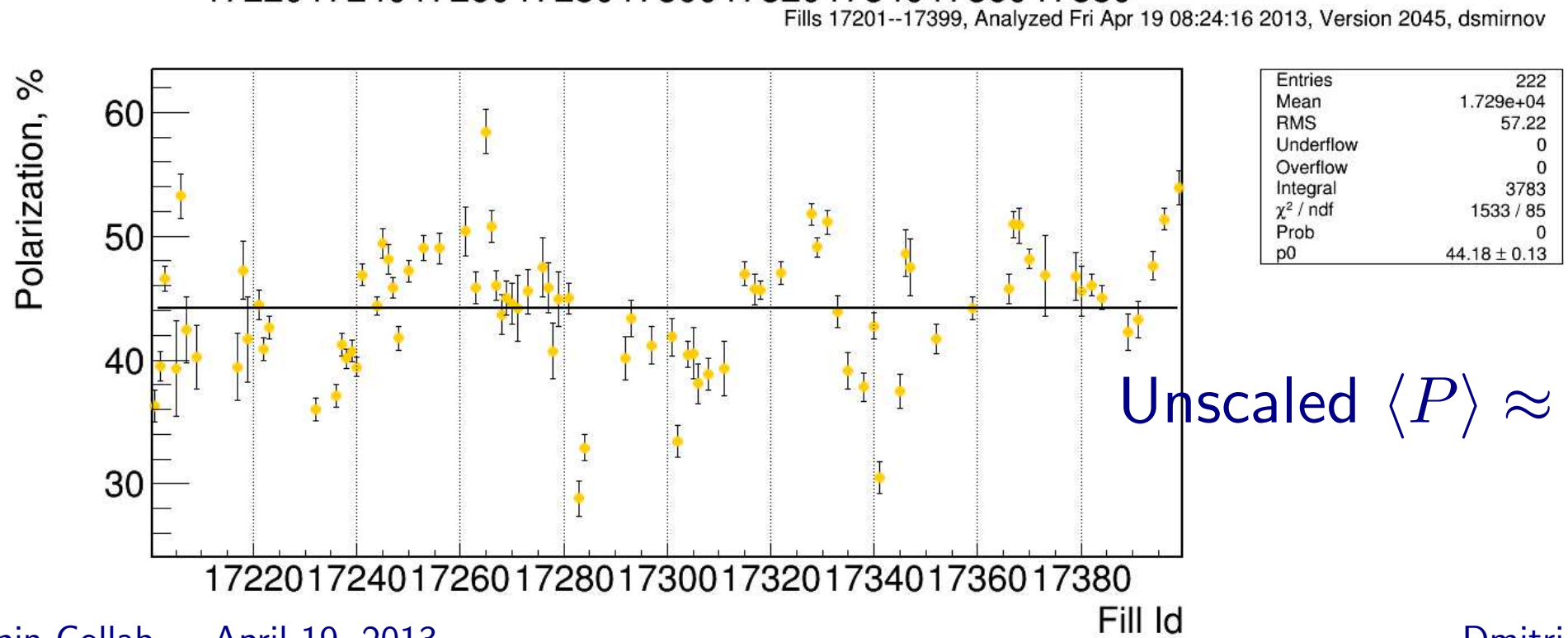
$$\frac{P_U}{P_D} = 0.99 \pm 0.02$$

- Both polarimeters agree well at injection

pC Polarimeters in Yellow, Flattop $E_{\text{beam}} = 255$ GeV

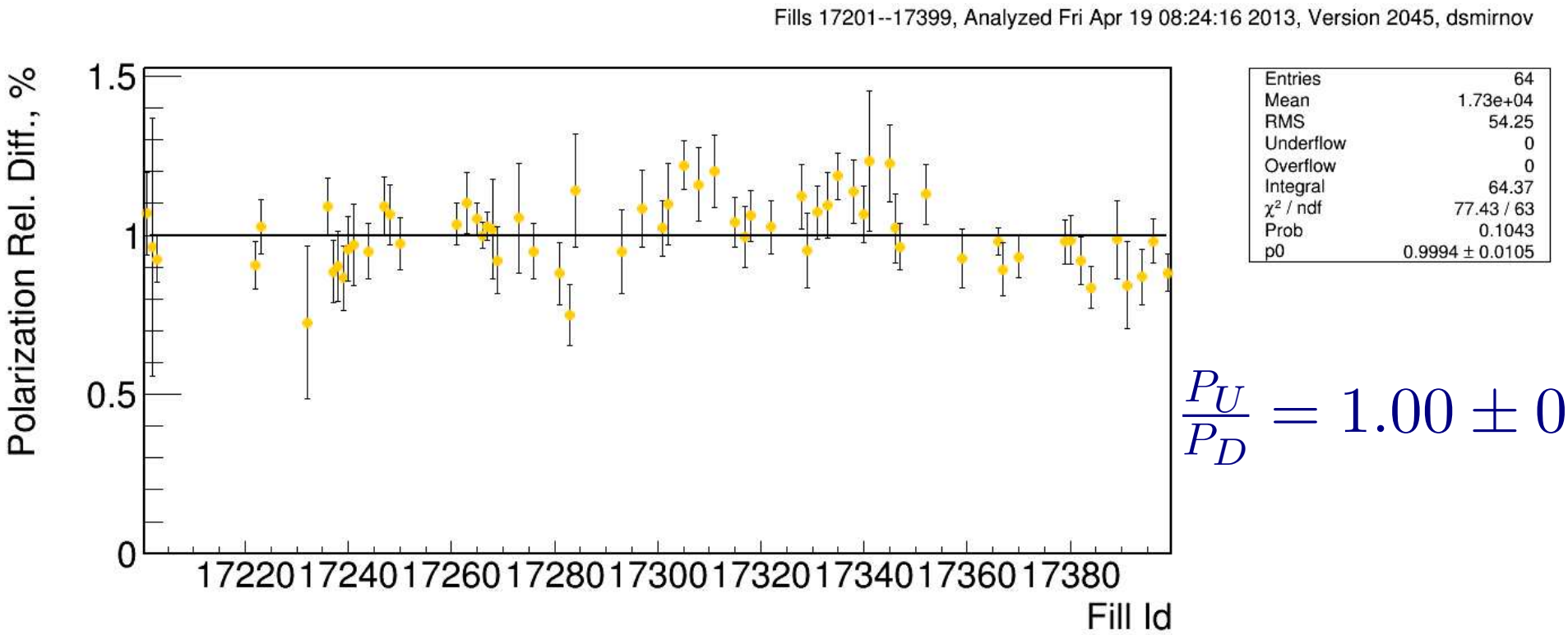


Unscaled $\langle P \rangle \approx 44\%$



Unscaled $\langle P \rangle \approx 44\%$

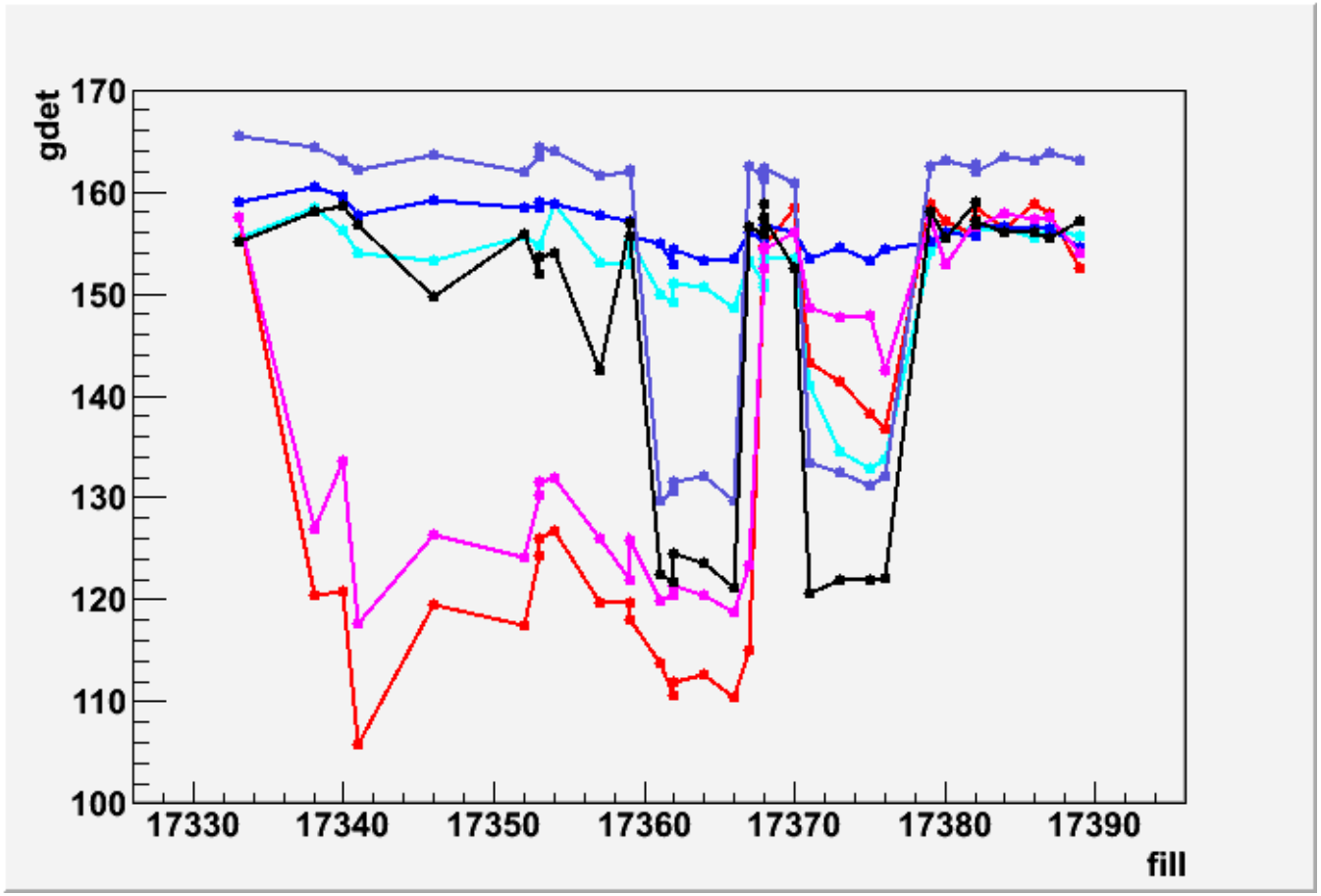
Y2U/Y1D Consistency, Flattop $E_{\text{beam}} = 255$ GeV



$$\frac{P_U}{P_D} = 1.00 \pm 0.01$$

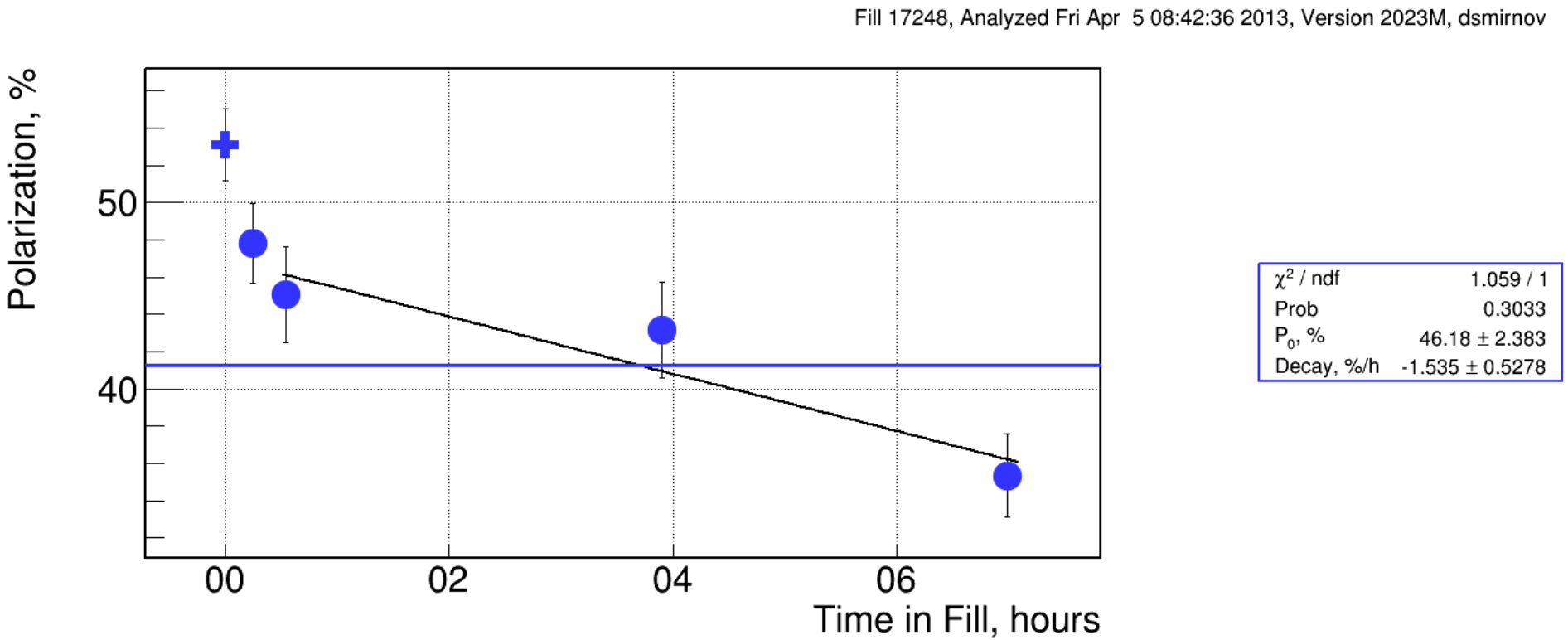
- Both polarimeters agree well on average
- Y1 and Y2 track each other very well at both injection and flattop

Changing Detector Gains

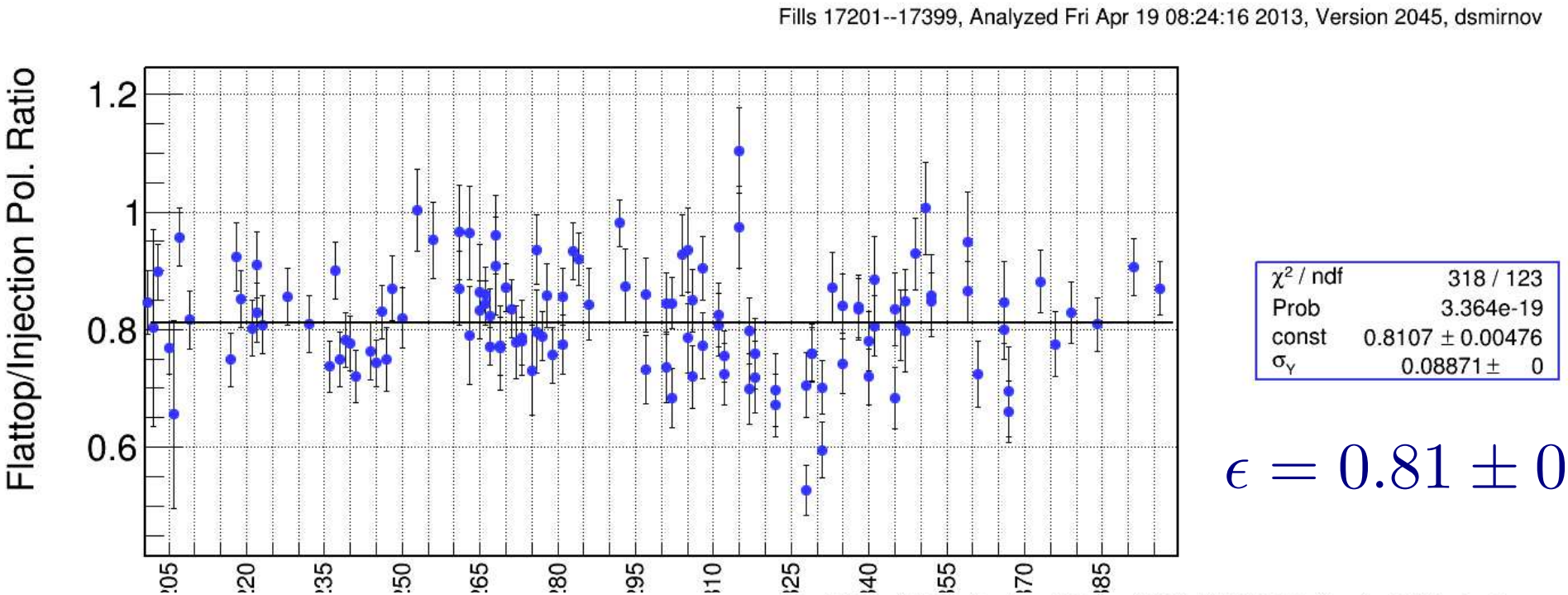


- New this year: Changing gains in some detectors
- Automatically take α calibaration runs after each fill
- Investigating dependance of detector gain on leakage current

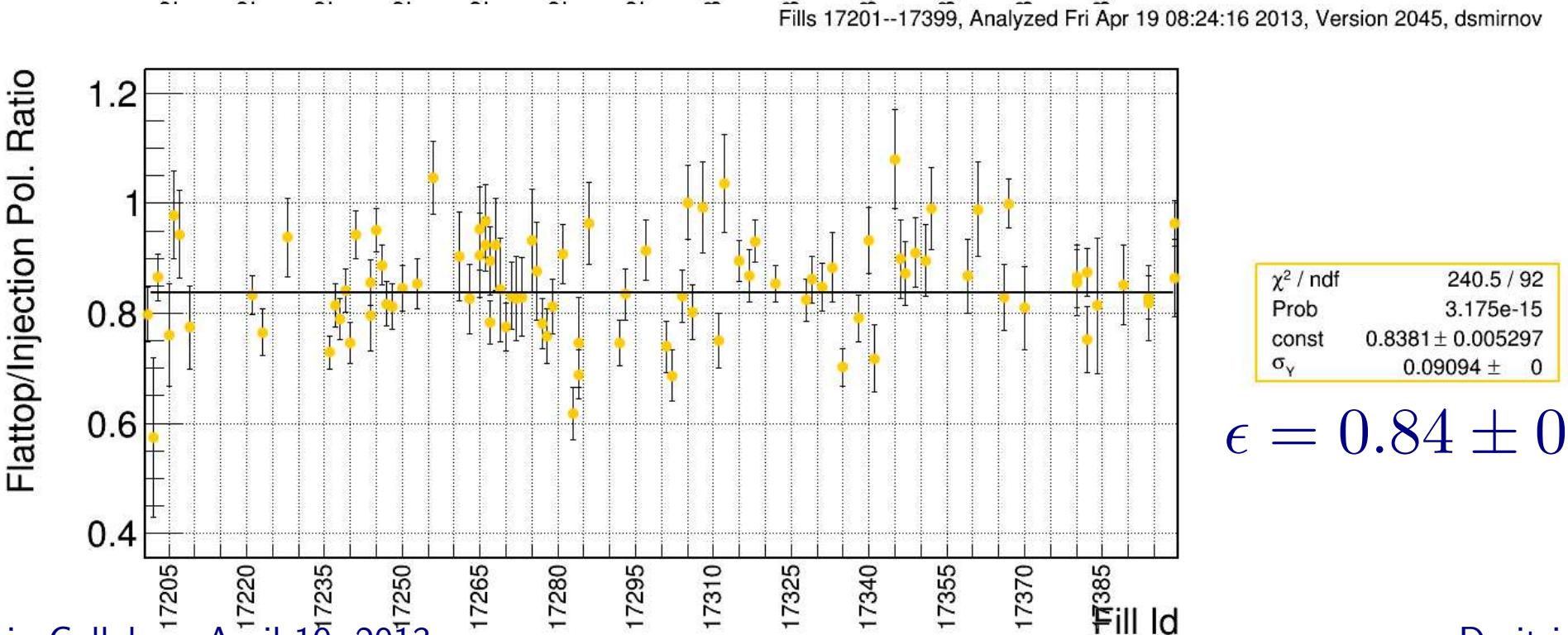
Polarization Losses in a Fill



Energy Ramp Efficiency

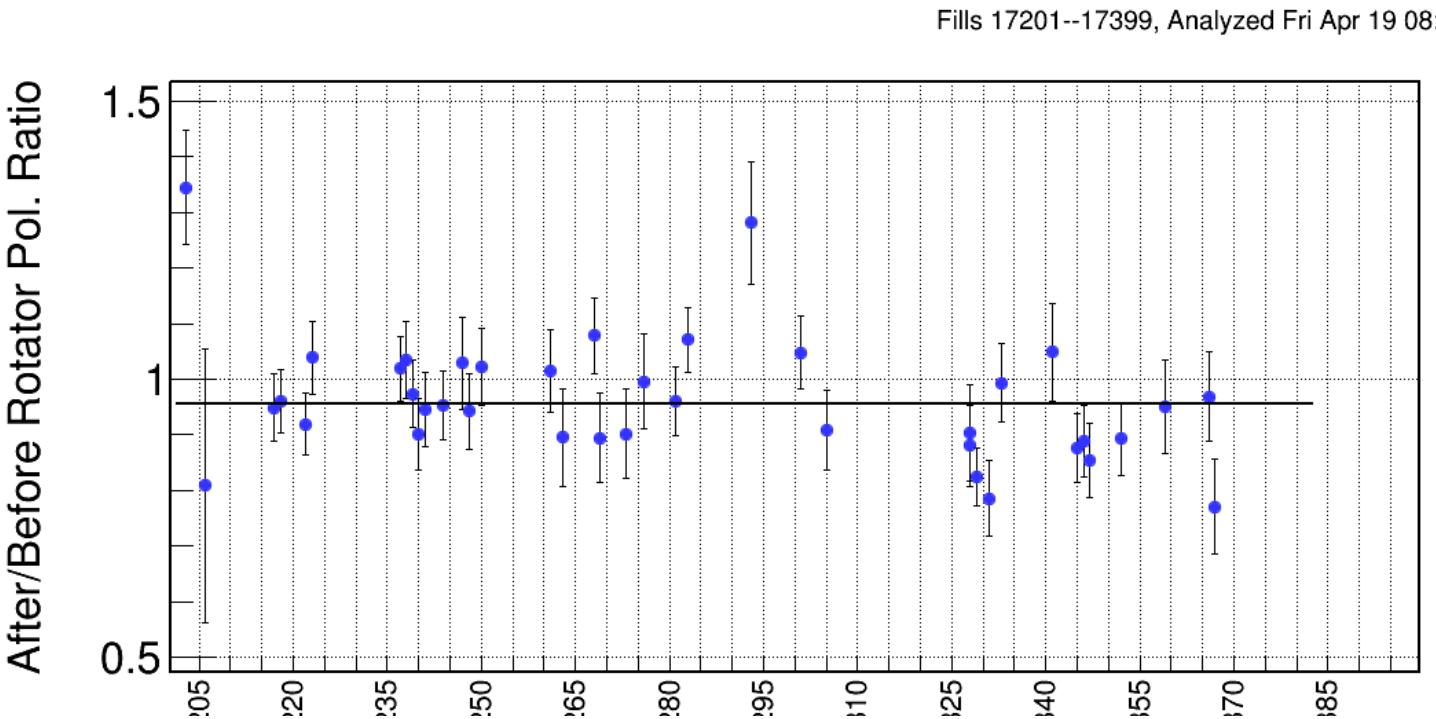


$$\epsilon = 0.81 \pm 0.01$$

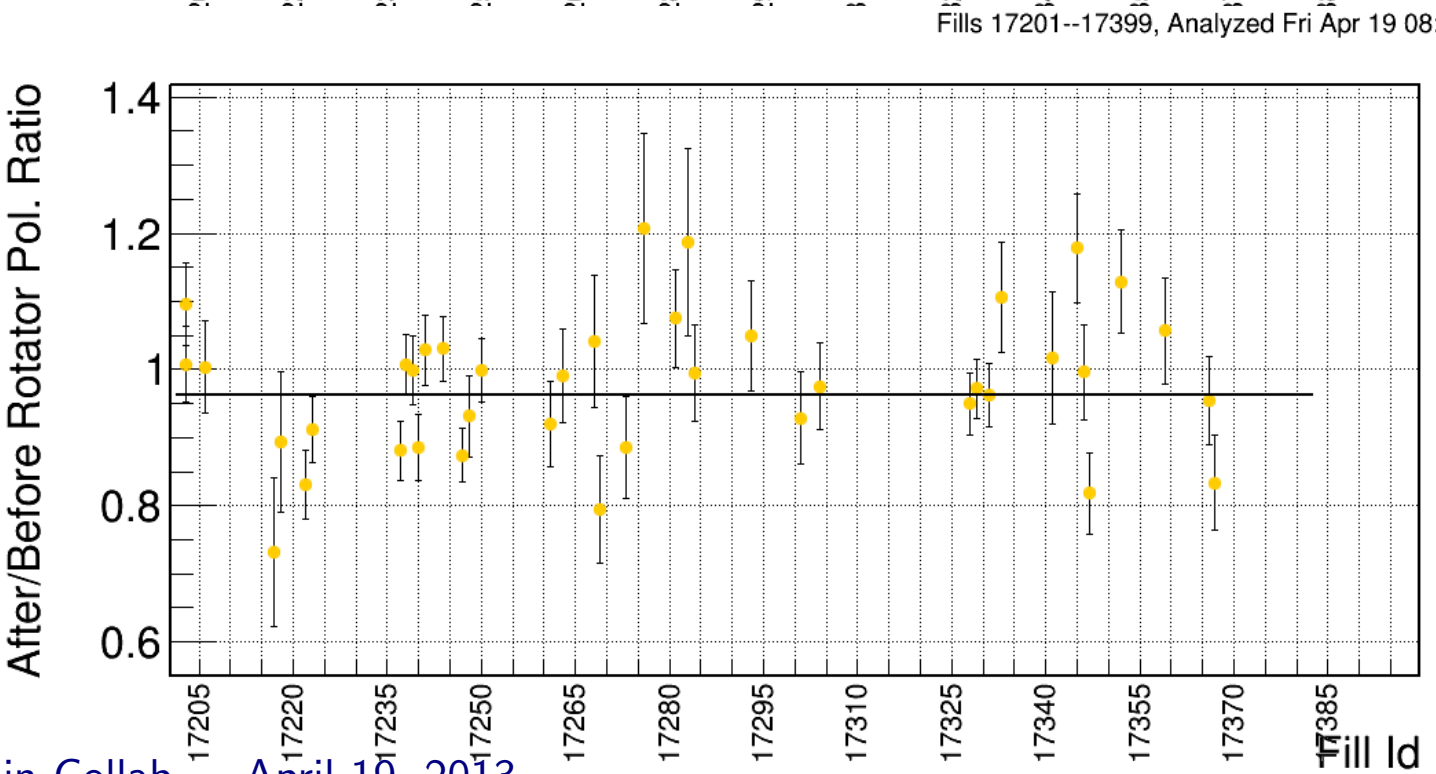


$$\epsilon = 0.84 \pm 0.01$$

Rotator Ramp Efficiency

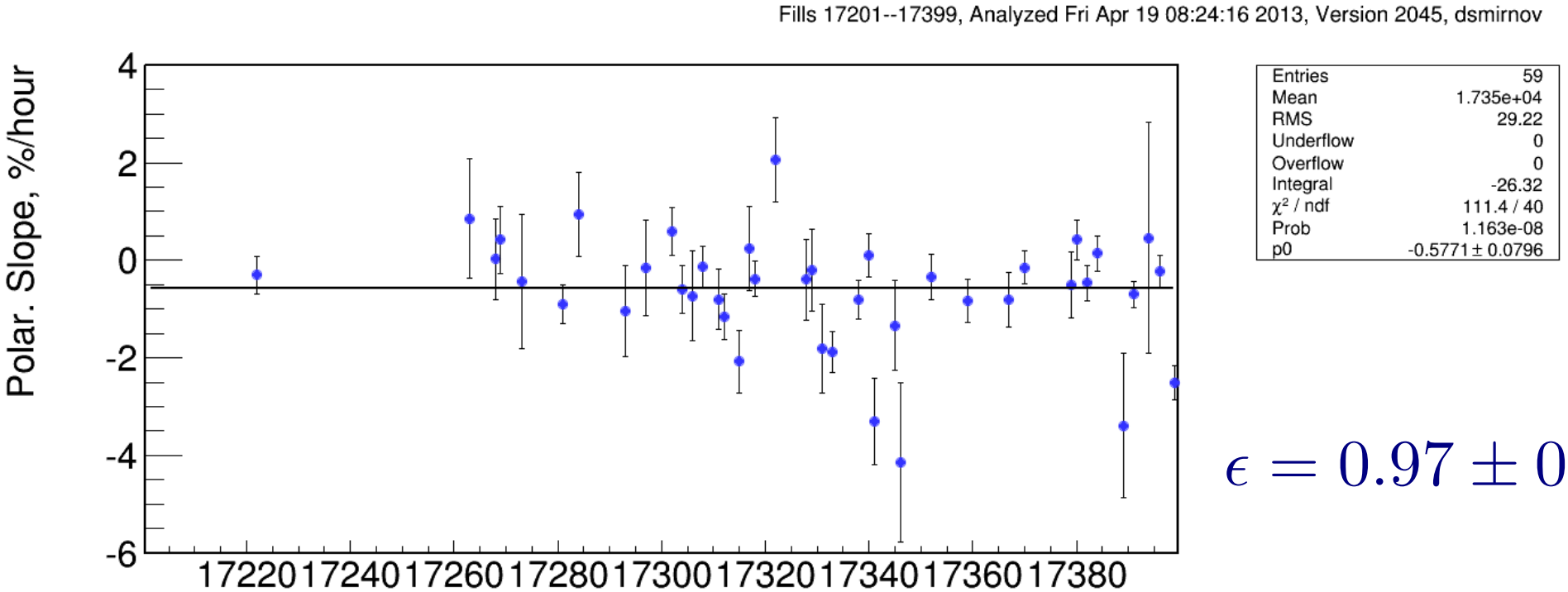


$$\epsilon = 0.95 \pm 0.01$$

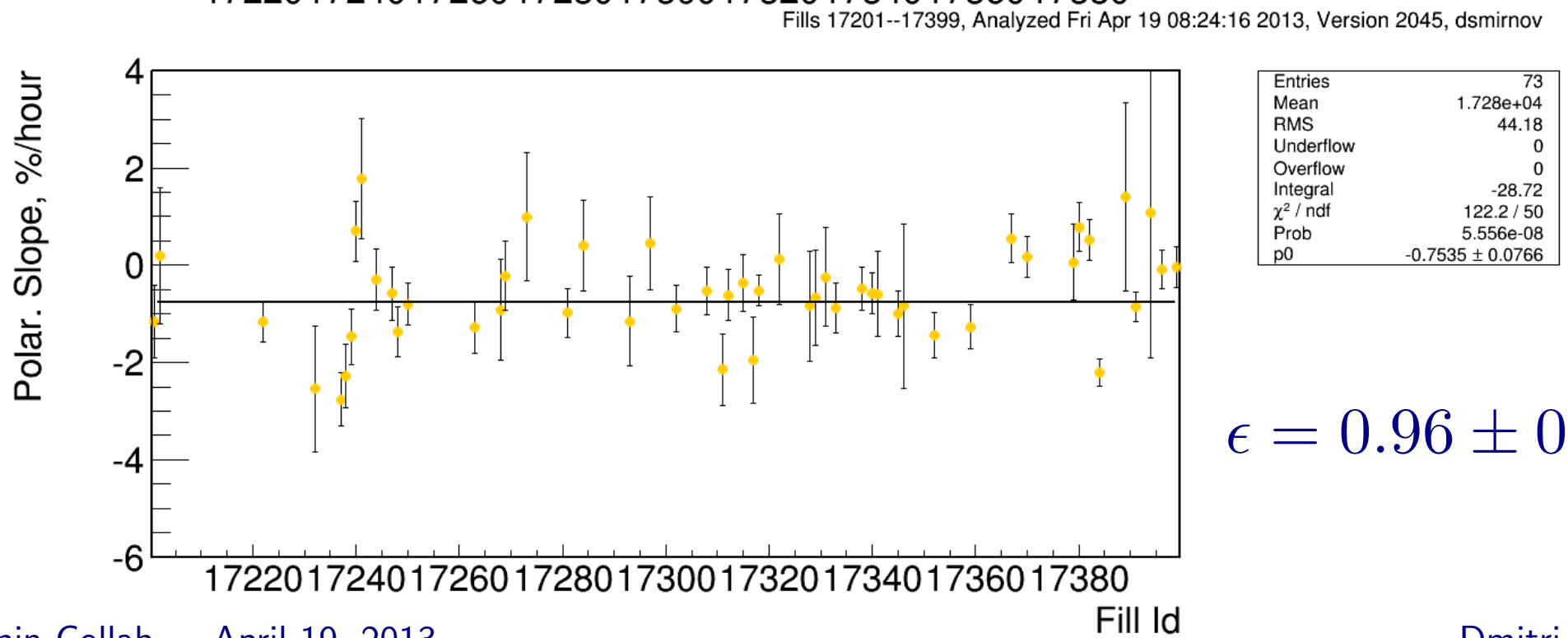


$$\epsilon = 0.96 \pm 0.01$$

Polarization Decay in Fill

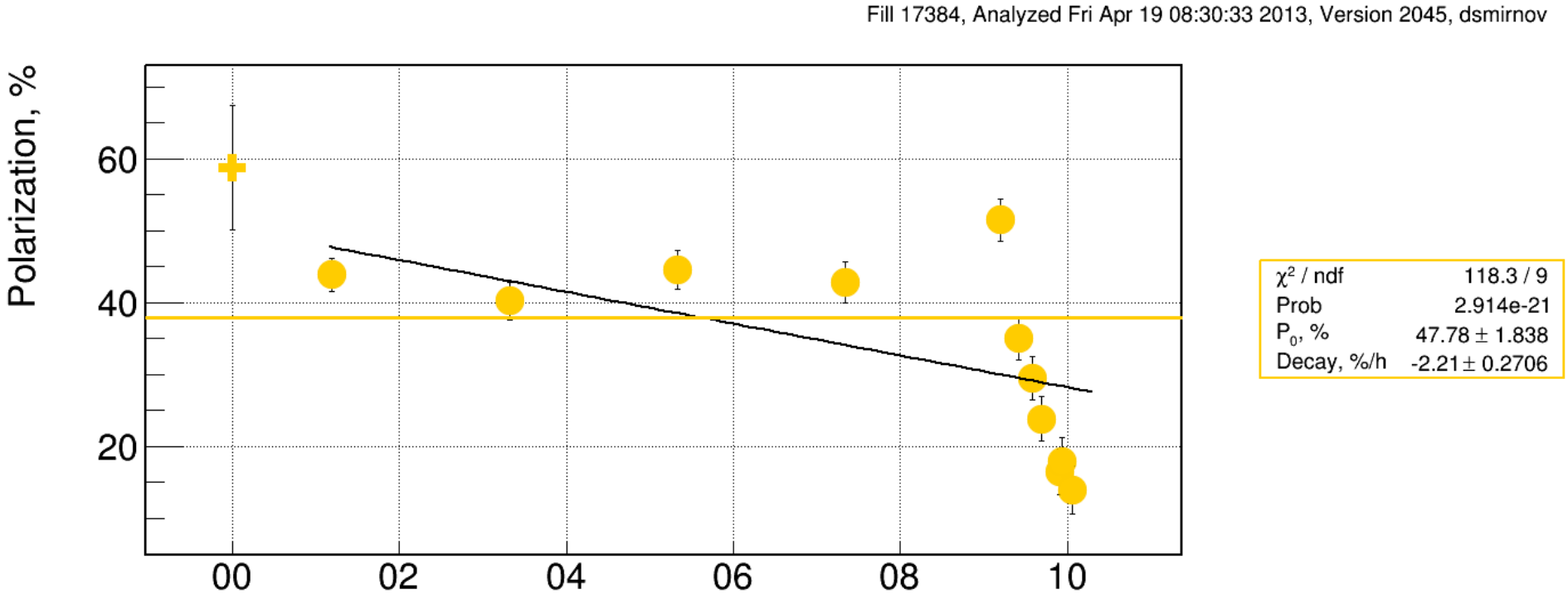


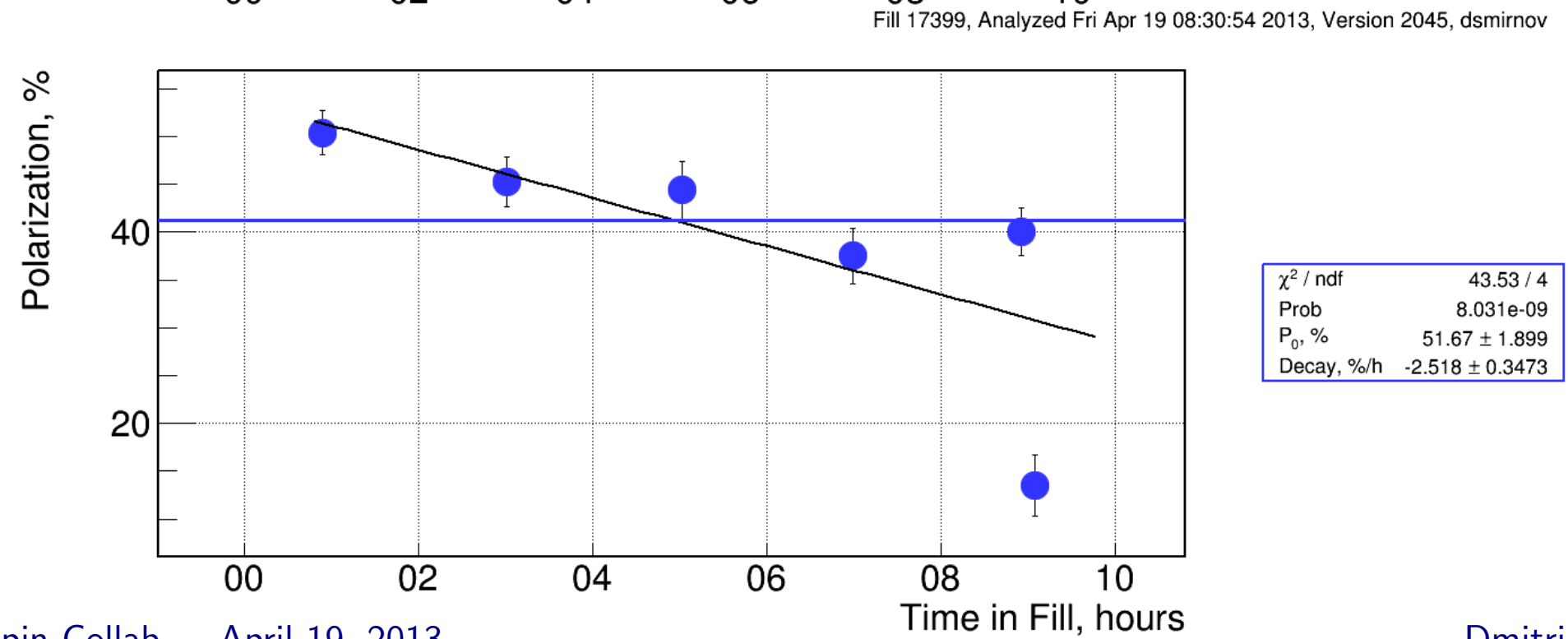
$$\epsilon = 0.97 \pm 0.01$$



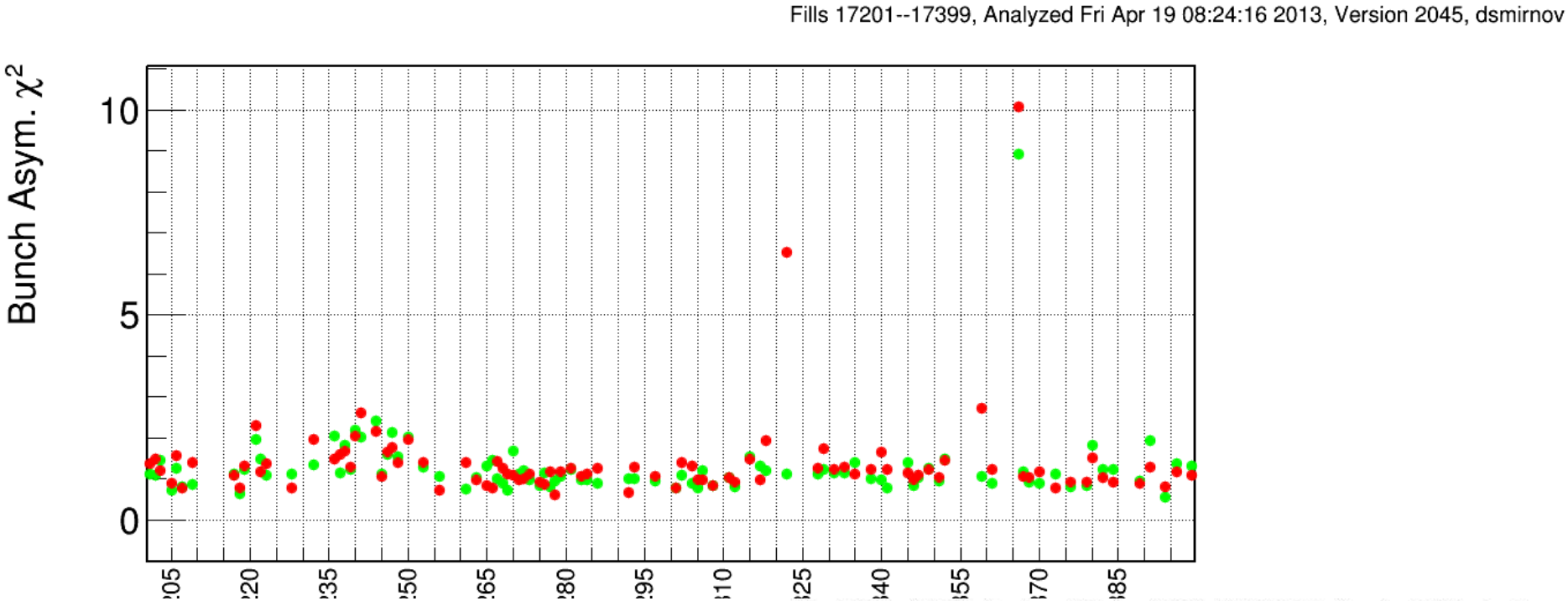
$$\epsilon = 0.96 \pm 0.01$$

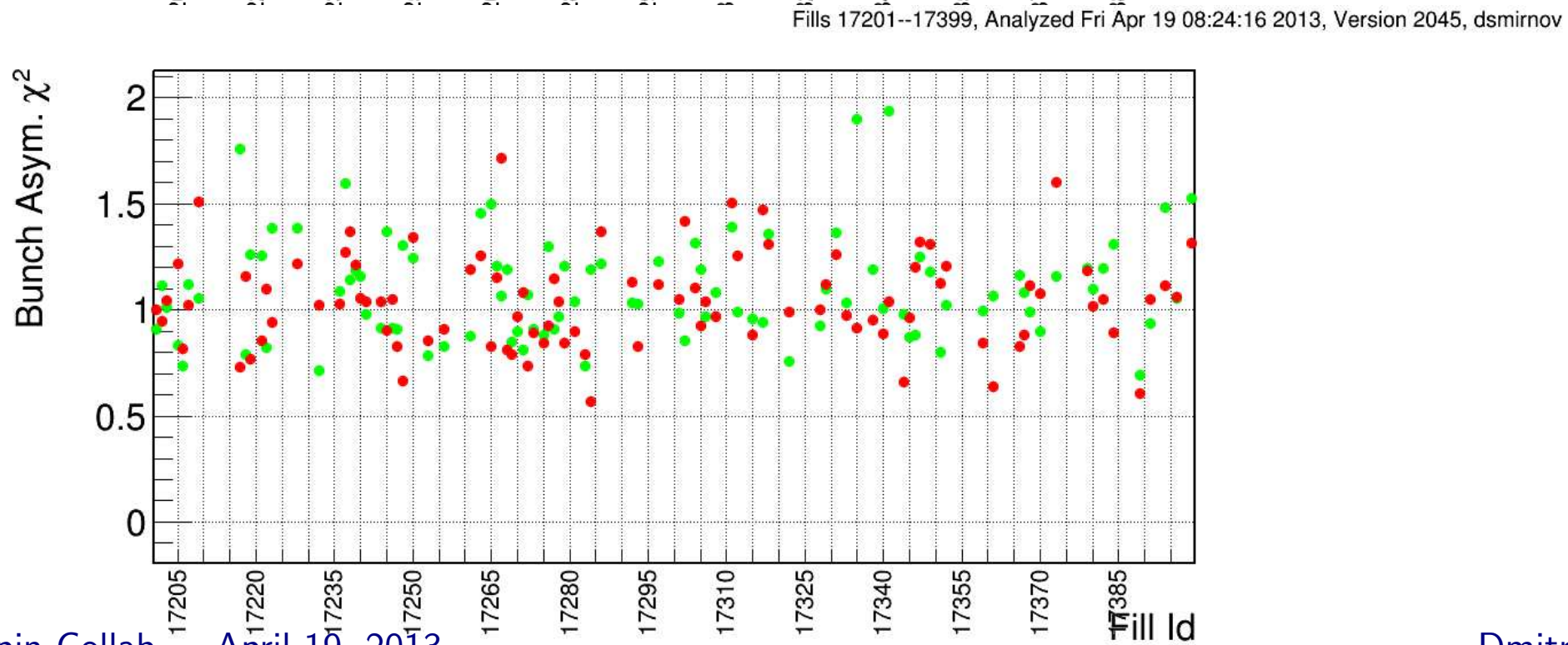
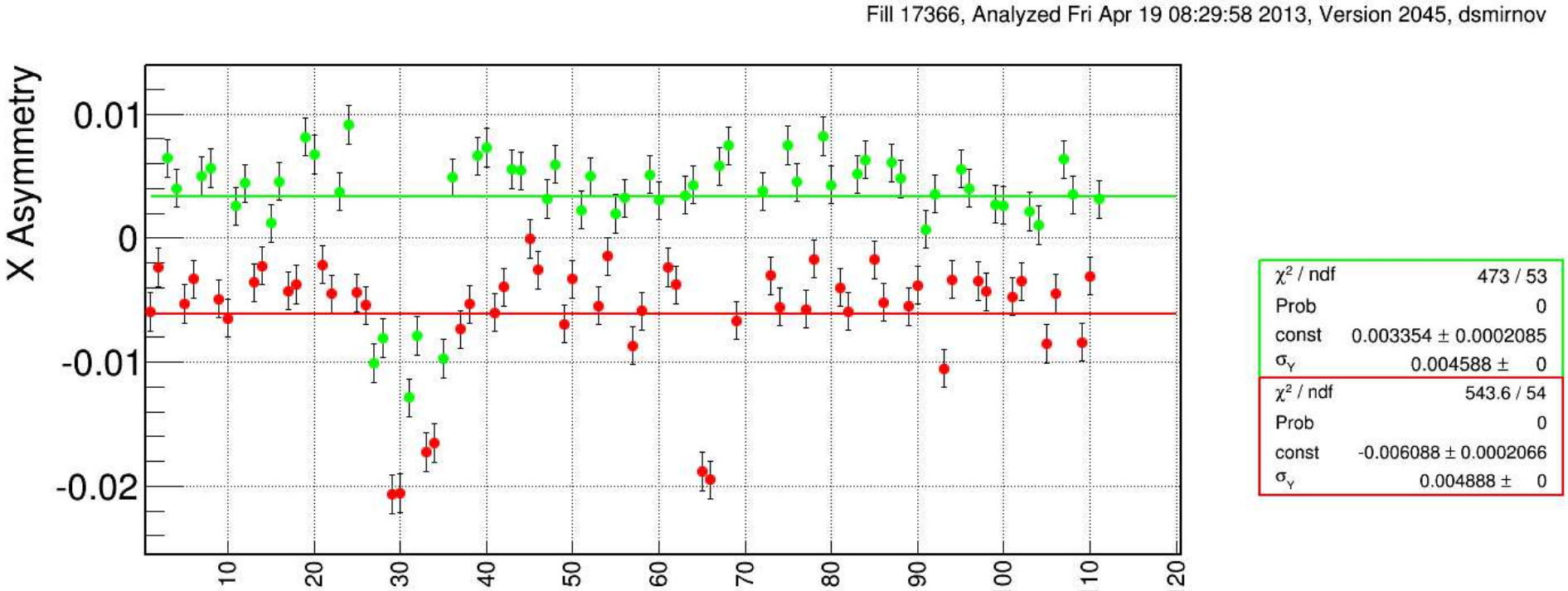
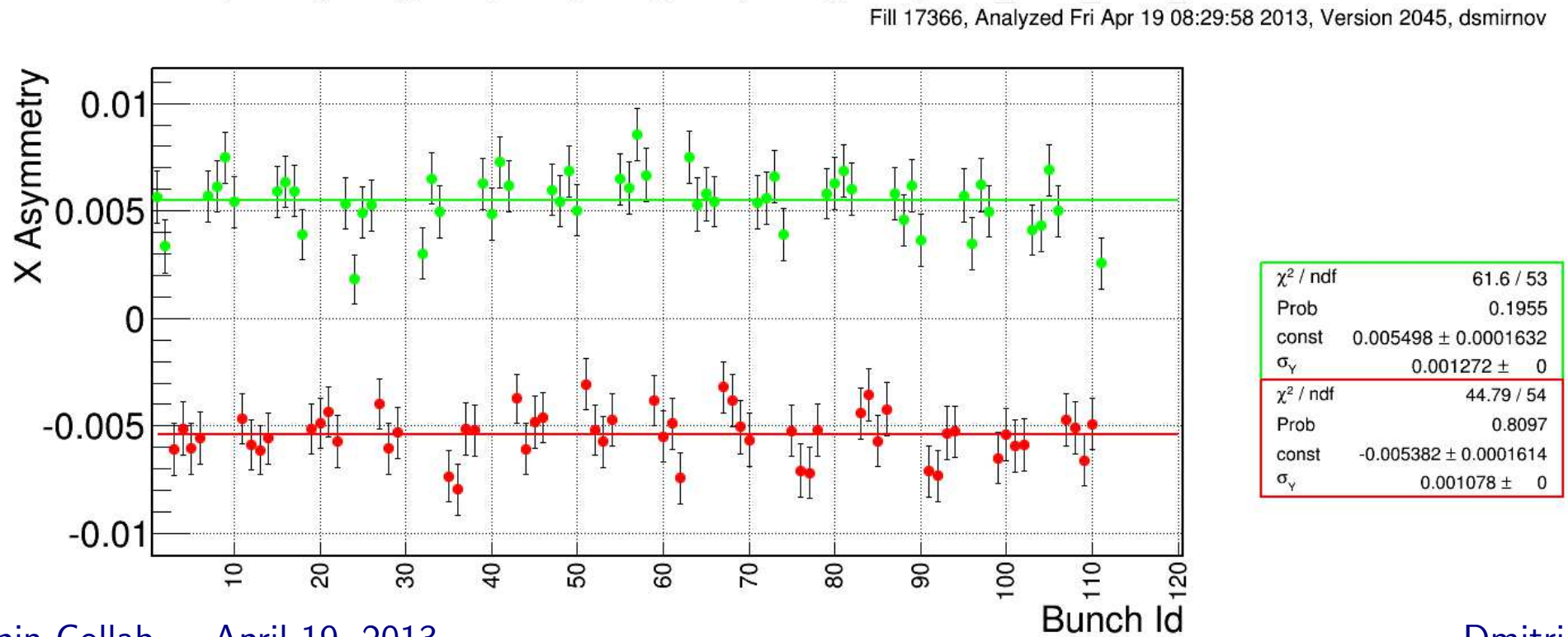
Polarization Decay in Fill





Bunch Asymmetries





Bunch Asymmetries