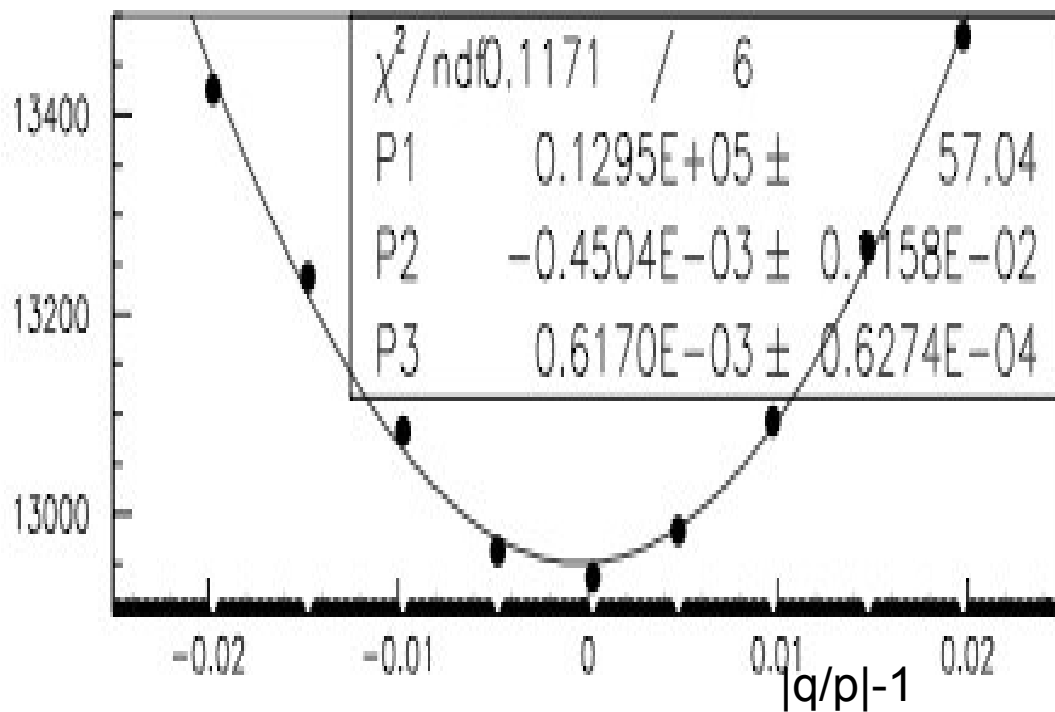# Status of the D*lv q/p Analysis

Martino 1/27/09

Last AWG Meeting: end of a long story...

Bias completely removed from the SIG+BKG B^0 Global fit!

In the following:
- **Fit Strategy Optimization**
- **B^0+B^+ results**

B^0 Fit Strategy Optimization

Btag & Dtag samples show different semileptonic asymmetries:

$Asl(Btag)=-2(|q/p|-1)$ (lepton & kaon from different Bs)
$Asl(Dtag) = Asl(Btag) * \chi_d$ (lepton & kaon from same B)

wich reflects in a q/p dependence of the Dtag Fraction

Two alternative strategies exploited:

→ Dtag Fraction fitted as a "running" parameter ($\cos\theta_{Kl}$ shape from MC);

→ Explicit Dtag Fraction q/p dependence introduced in the fit
  (float FDtag($|q/p|=1$))

Reconstruction Asymmetry from the B^0 tag+untag event sample:

$Areco = (N(l^+)-N(l^-))/(N(l^+)+N(l^-))$

→ shows a q/p dependence (single tag asymmetry as for the Dtag sample)

→   Correction included in terms of the floating q/p value
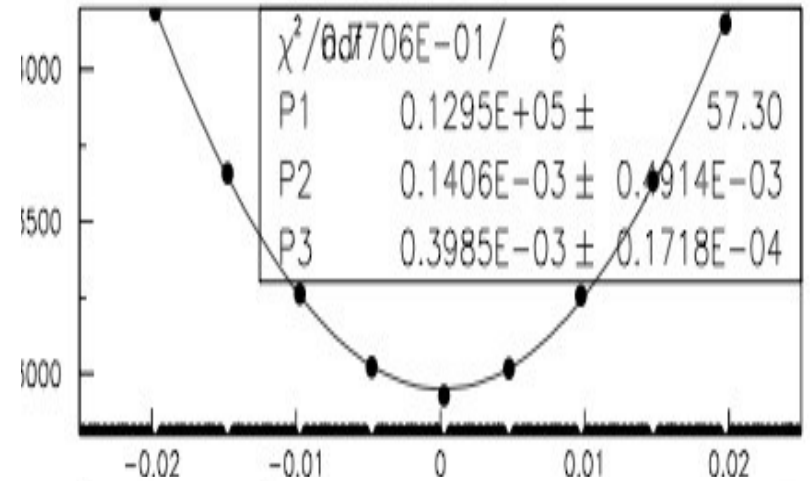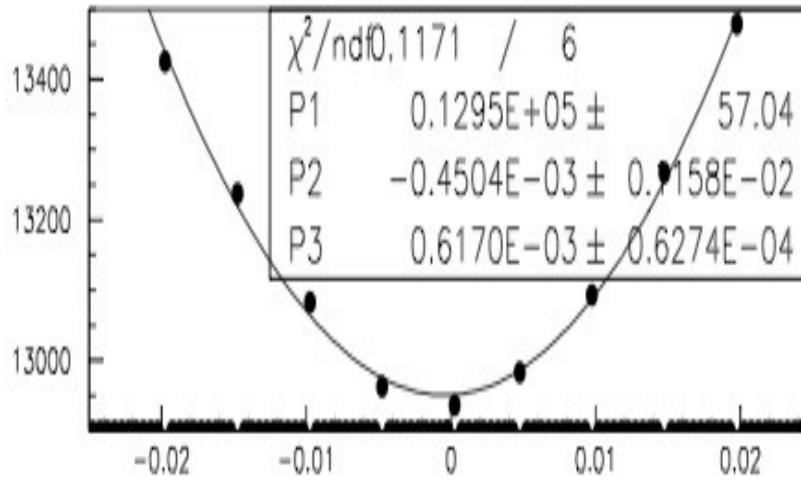
B^0 Results: Fixed FDtag

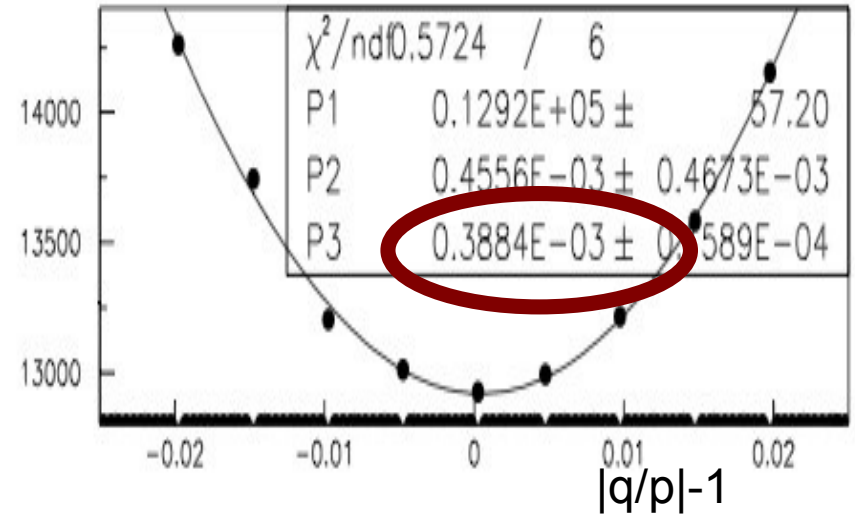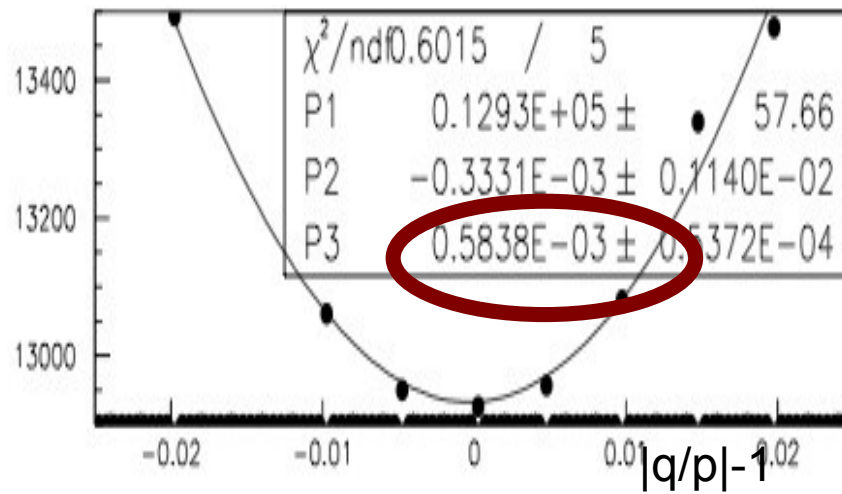FDtag q/p correction:

Areco q/p Correction:
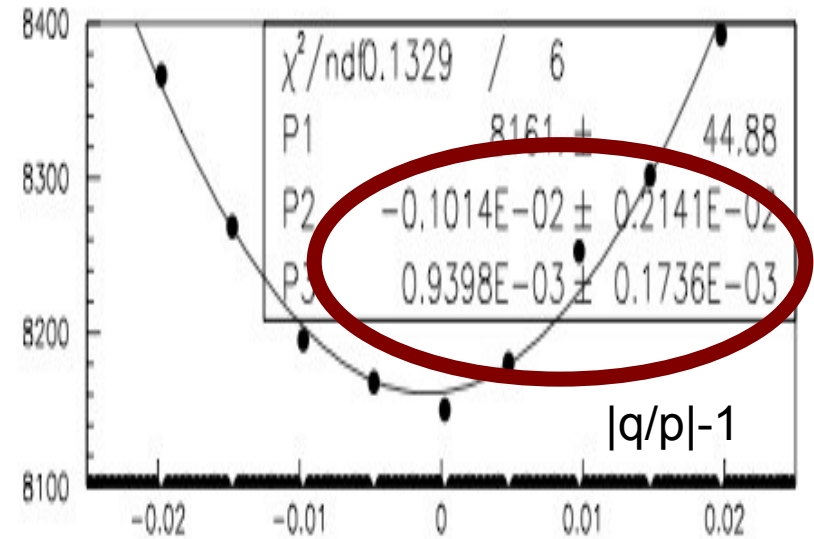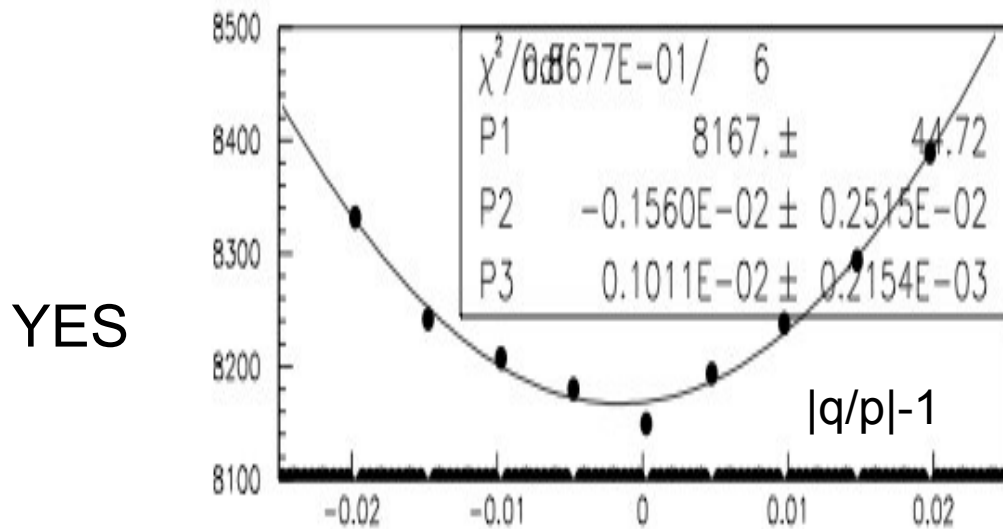
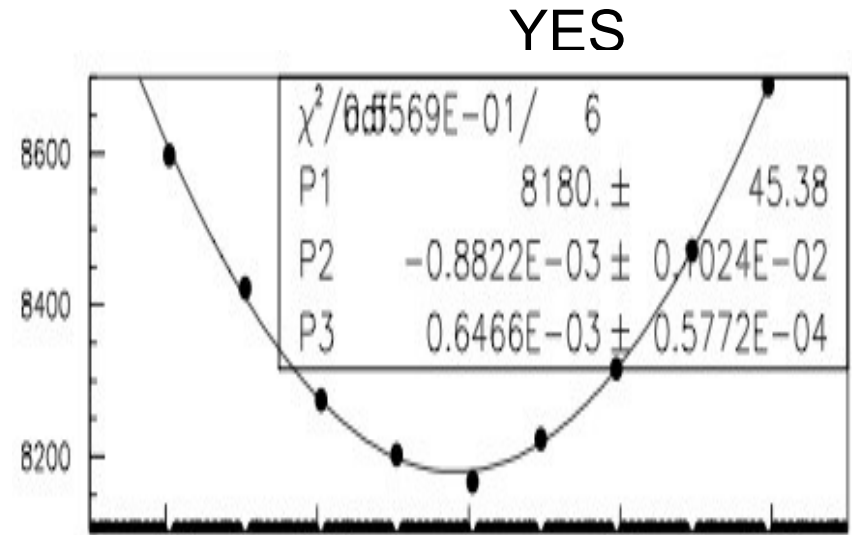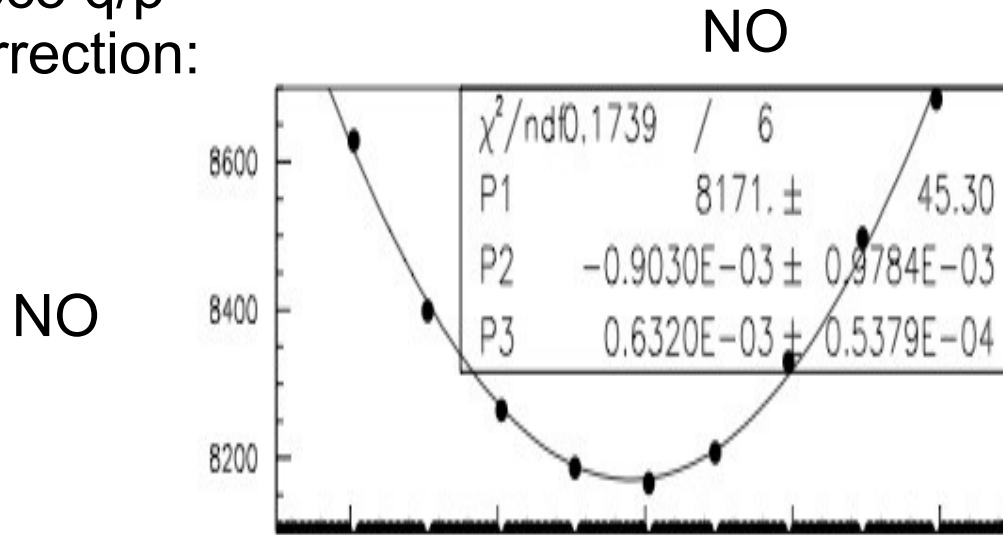NO — YES

NO

YES

|q/p|-1 |q/p|-1

No bias in all the approaches
Fdtag(q/p) correction improves the statistical error
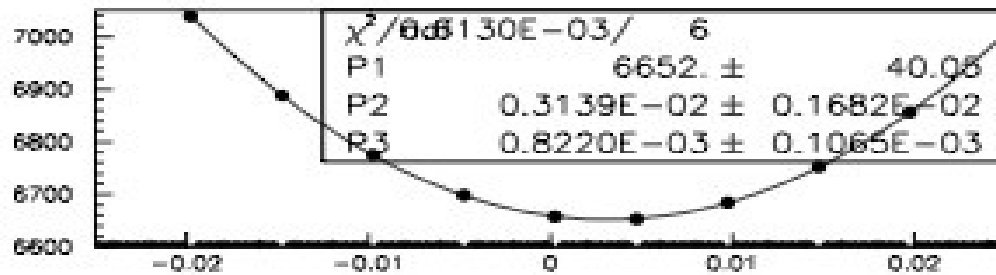
B⁰ Results: Floated FDtag
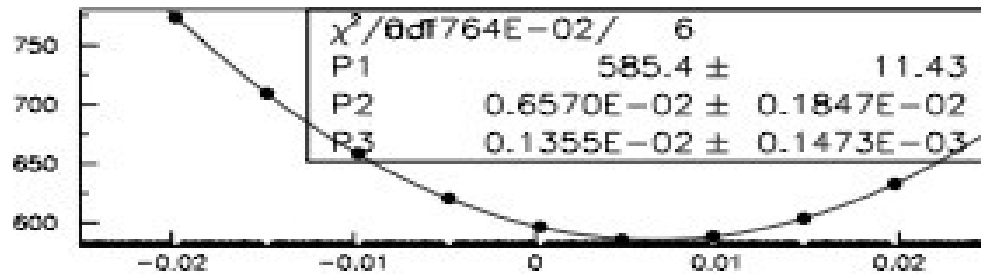
FDtag q/p correction:

Areco q/p
Correction:

Floated Fdtag: bigger statistical error, but no systematics from MC assumption
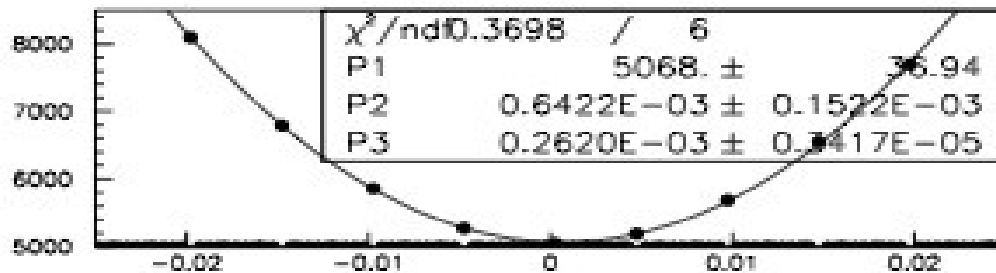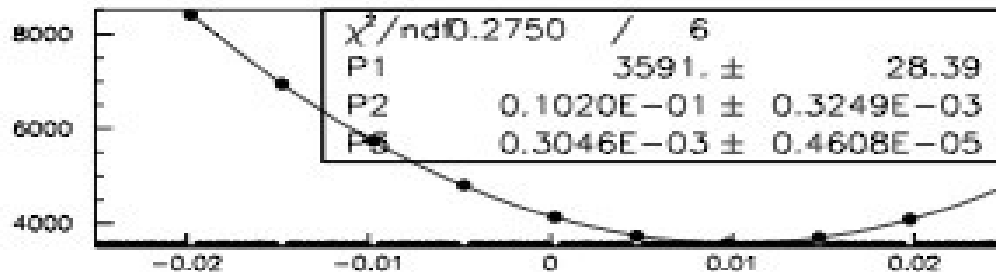Bias still at one sigma level

B$^+$ Results: Reconstruction Asymmetry

Peaking electrons

Peaking Muons

BKG electrons

BKG Muons

5

Reco Asymmetry from counting: B^0 vs B^+

B^+	e	μ	B^0	e	μ
Peak	0.0028±0.0011	0.0069±0.0013		-0.0006±0.0003	0.0075±0.0004
BKG	0.0011±0.0004	0.0114±0.0004		-0.0003±0.0004	0.0116±0.0004

$\delta(B^+-B^0)$	e	μ
Peak	0.0034±0.0011	0.0014±0.0006
BKG	-0.0006±0.0014	-0.0002±0.0005

Some discrepancy in the Peaking sector
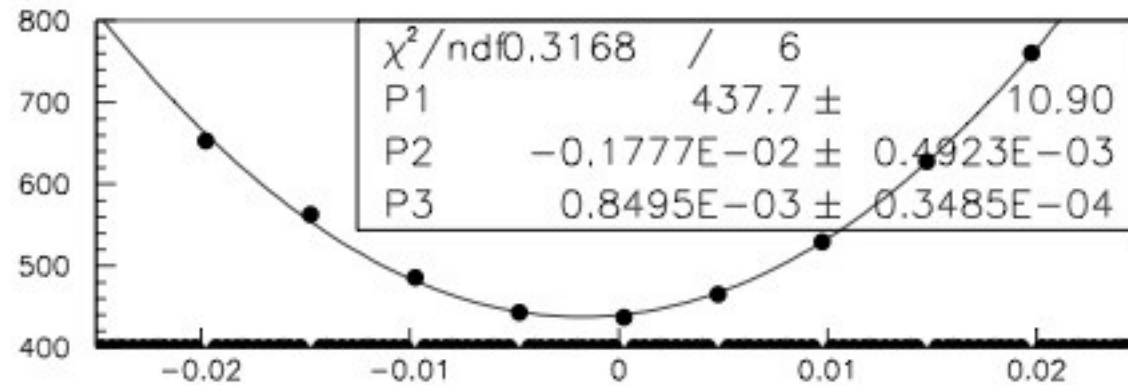**Could be at the origin of a q/p bias?**
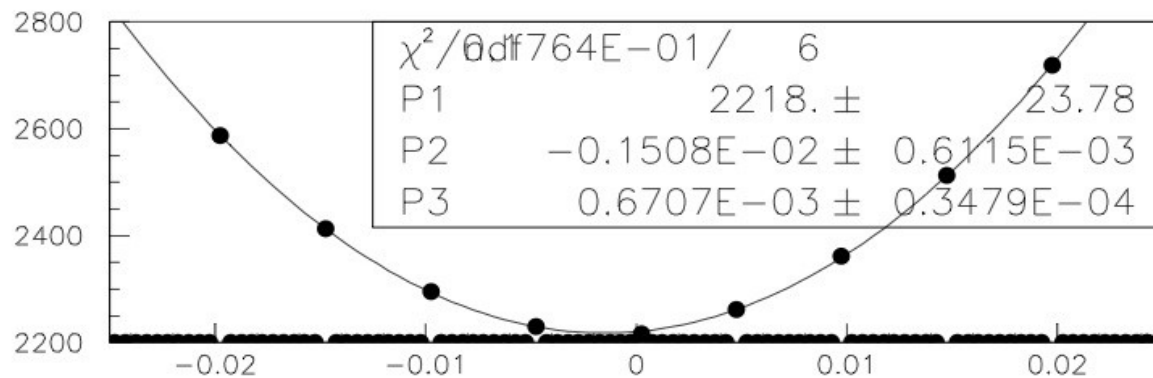
B⁰+B⁺ Results
(no Areco & Fdtag q/p corrections yet)
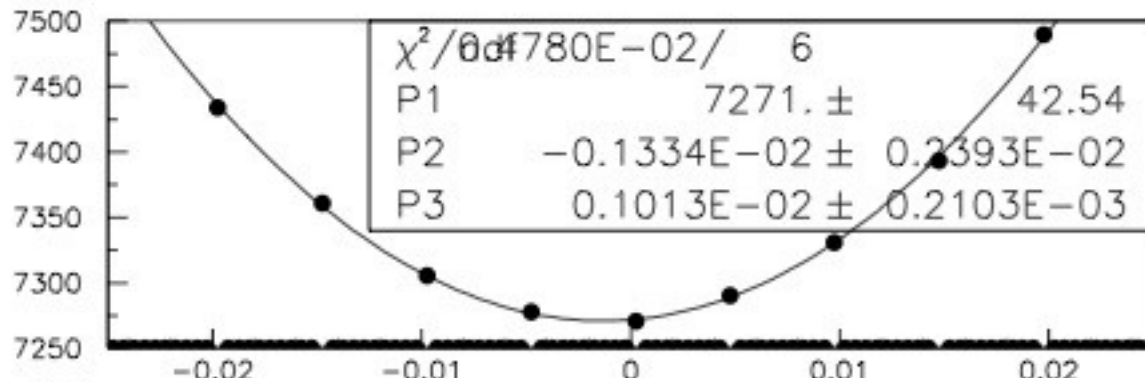
Peaking :

1.3 sigma bias

BKG:

2.1 sigma bias

Peaking+BKG:

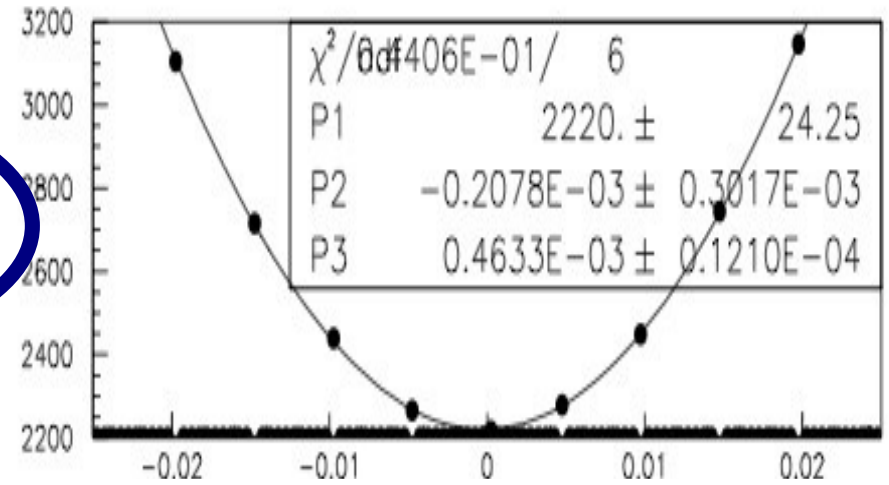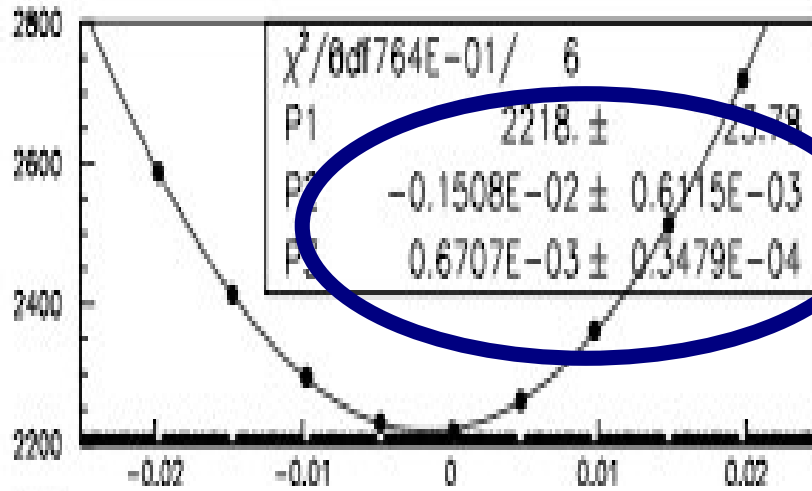**2.2 sigma bias...**

$|q/p|-1$

B[0] +B[+] Results: Fixed FDtag

FDtag q/p correction:

Areco q/p
Correction:
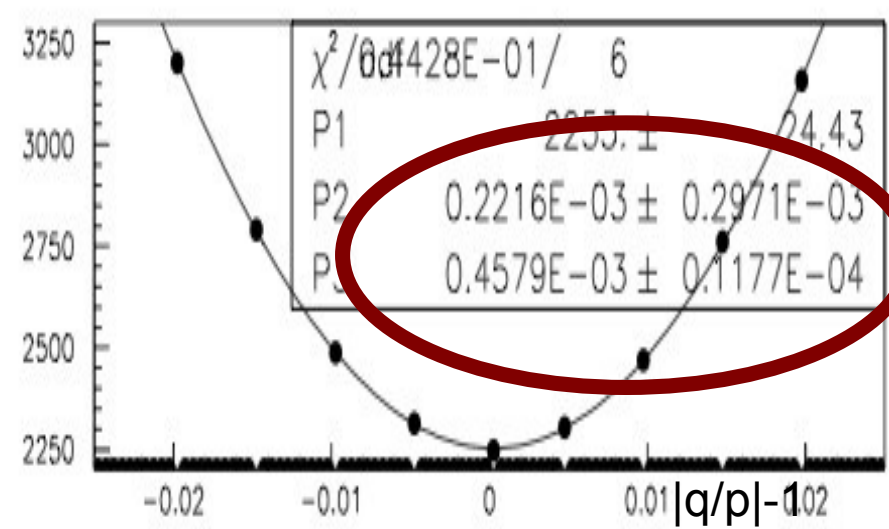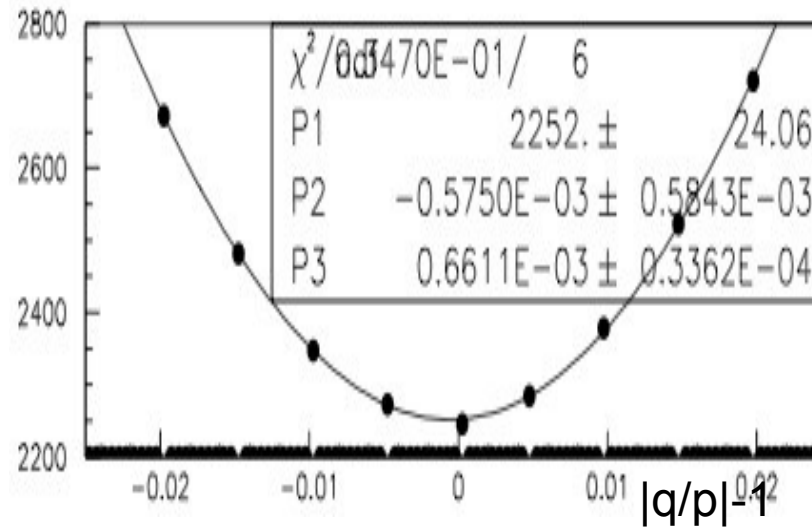

Both Fdtag & Areco corrections remove the bias!
Fits with floating Fdtag are still running...

Conclusions

• Optimization study shows the best strategy is to float FDtag in the q/p fit;

• q/p correction introduced in B^0 FDtag, Areco;

• Inclusion of B^+ in the fit almost finalized, no analysis bias emerged;

•Next Steps

• B^0+B^+ fit with free Fdtag are going on;

• Inclusion of continuum sample;

• Debug of SIG/BKG fraction vs mv^2 ;

• Toy MC Validation;

• Systematics;