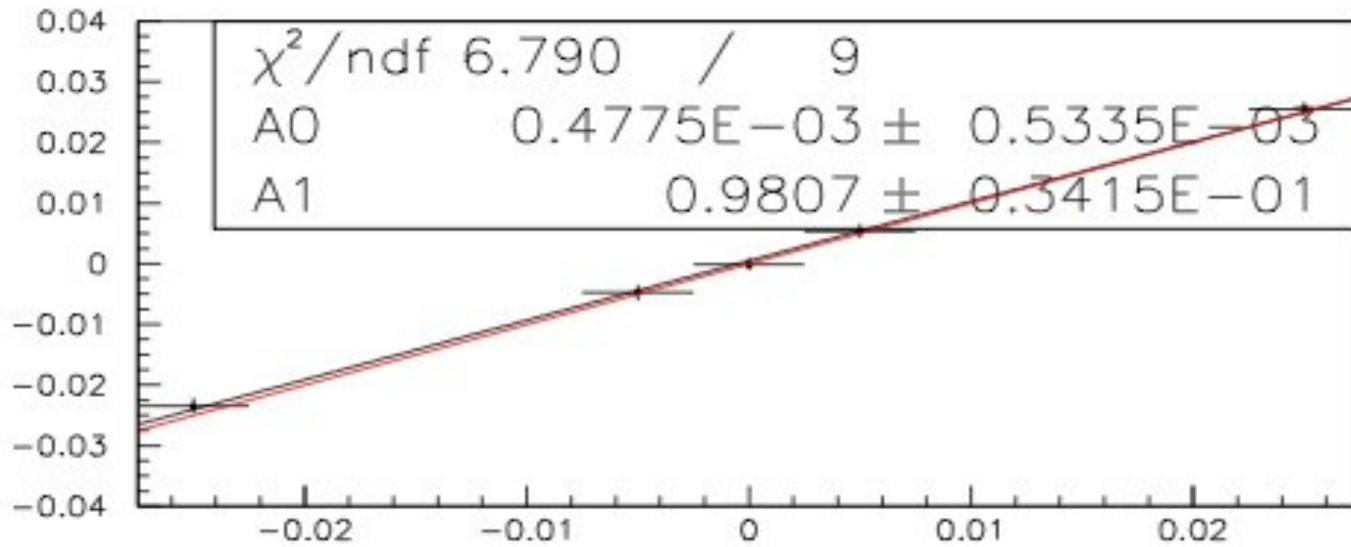# RC Meeting, June 13 2012

News:

- Validation using uncorrelated subsamples:
  - → MC: Analysis bias study
  - → Data: Fit stability vs $K+, K-)$

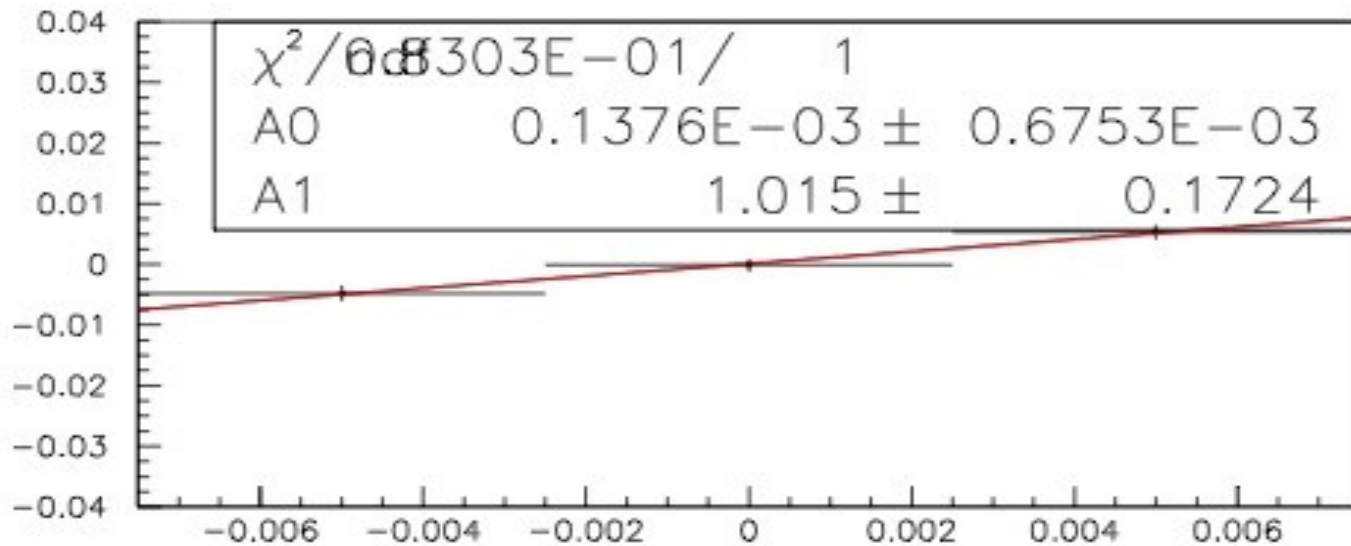- Toy Monte Carlo

- Systematic errors

Caveat: all the results are obtained without floating the resolution parameters
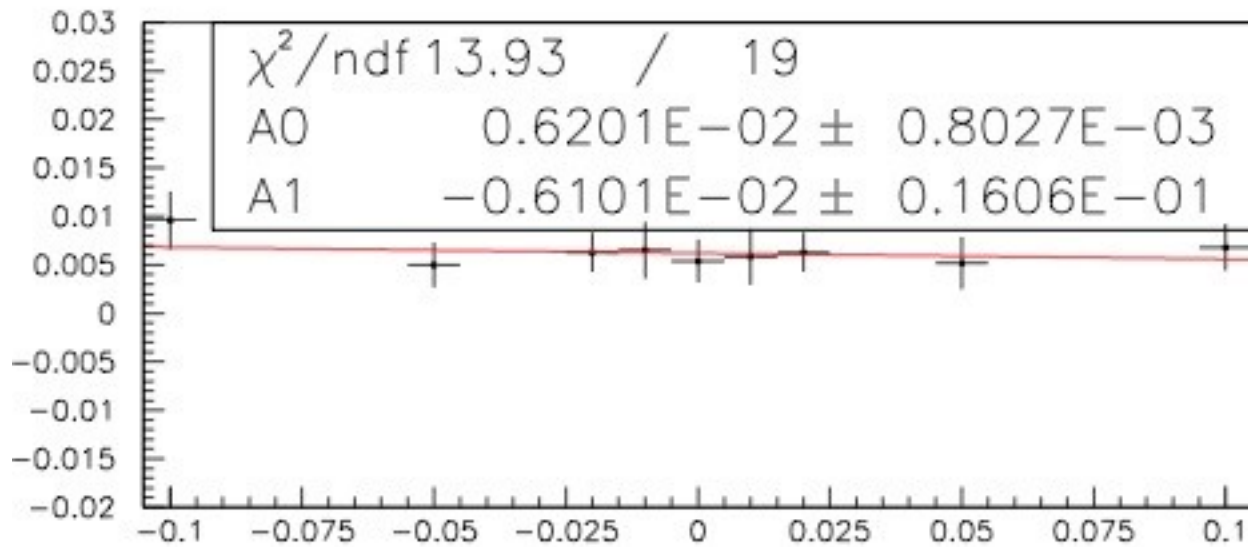
Fitted vs Generated |q/p|−1

χ²/ndf 6.790 / 9
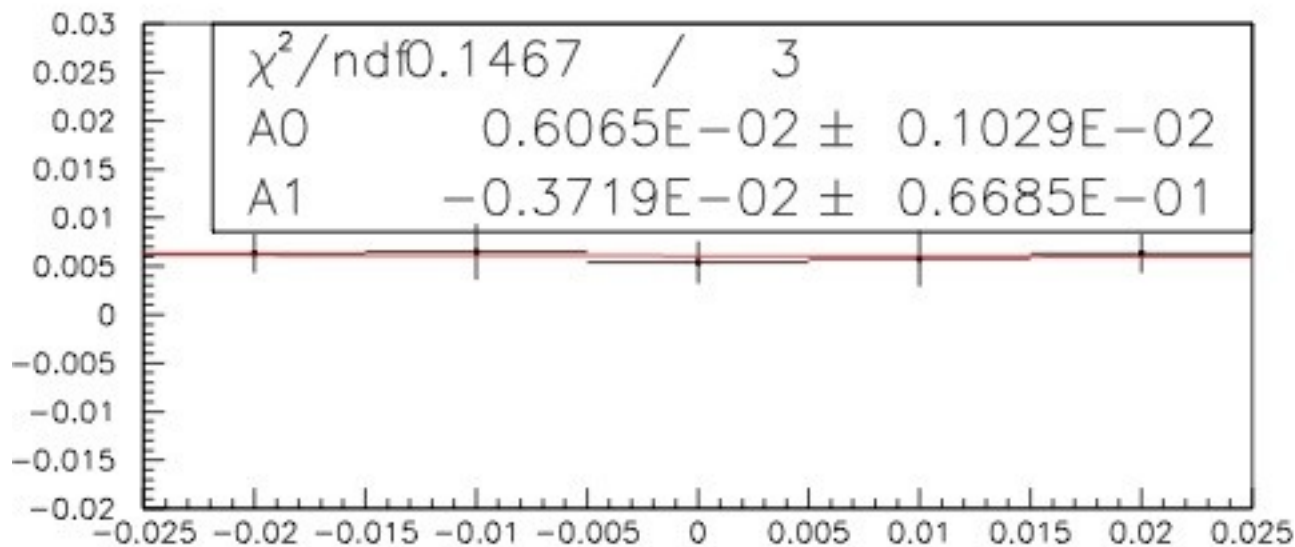A0   0.4775E−03 ± 0.5335E−03
A1   0.9807 ± 0.3415E−01

MC
Uncorrelated
Subsamples

χ²/ndf 8303E−01/ 1
A0   0.1376E−03 ± 0.6753E−03
A1   1.015 ± 0.1724

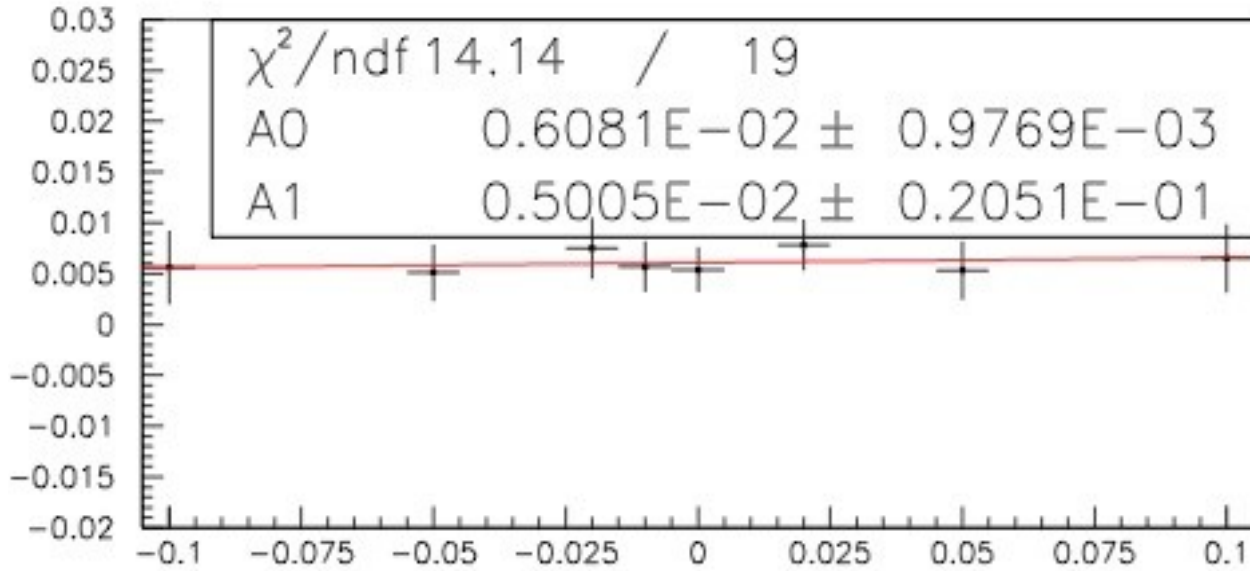Restricted
Range

|q/p|−1 vs Δε Reco

Real Data Uncorrelated Subsamples

Restricted Range

3

$|g/p|-1$ vs $\Delta \varepsilon_{Tag}$

χ^2/ndf 14.14 / 19

A0   0.6081E-02 ± 0.9769E-03

A1   0.5005E-02 ± 0.2051E-01

Real Data
Uncorrelated
Subsamples

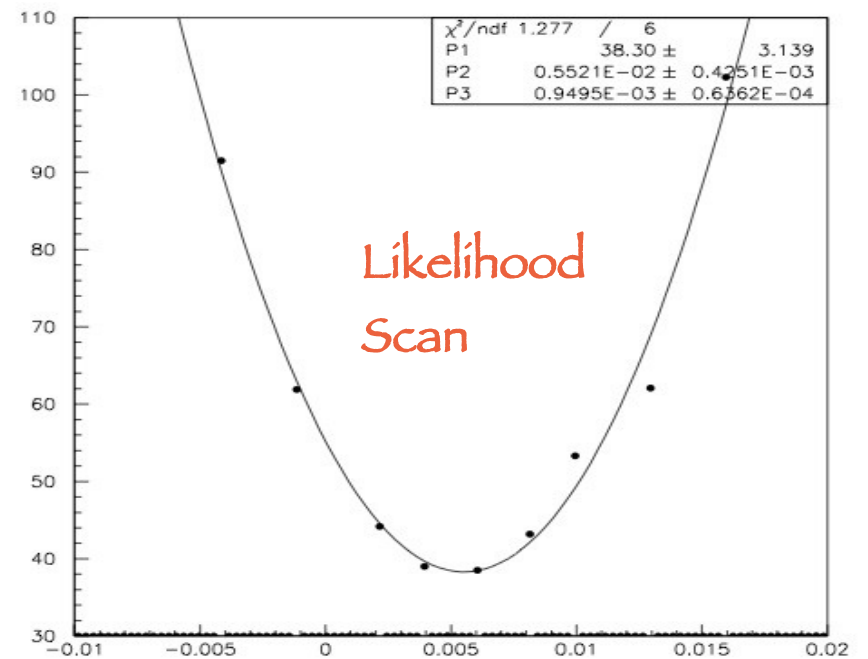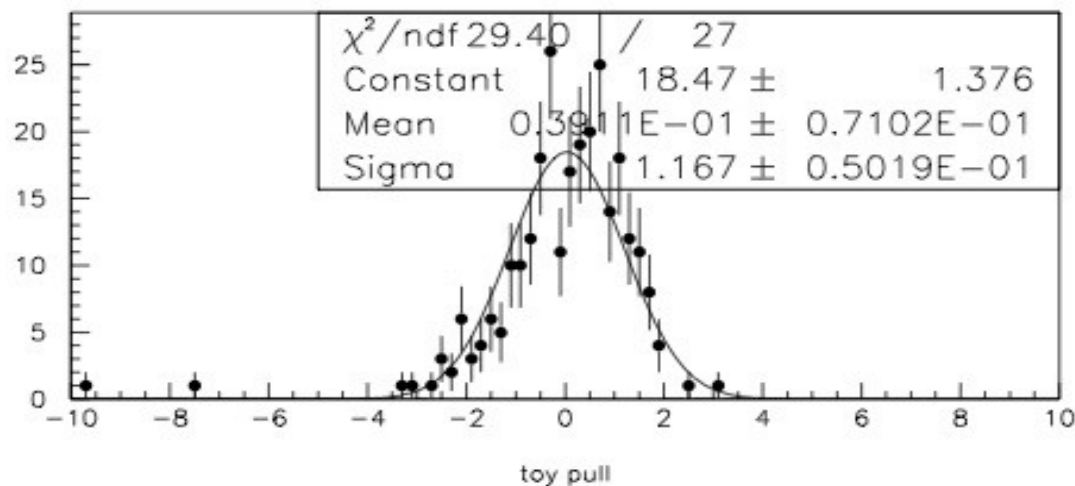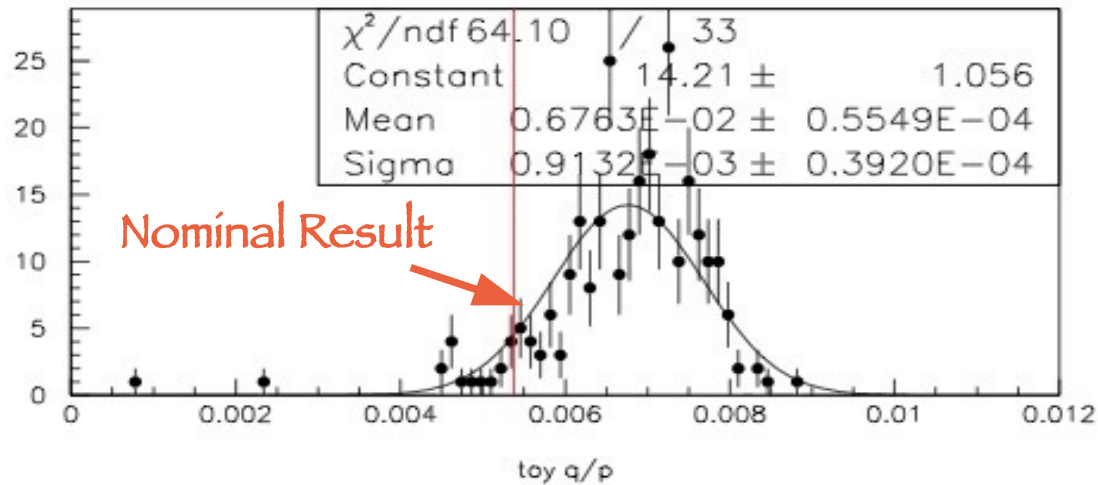χ^2/ndf 1.664 / 3

A0   0.6467E-02 ± 0.1255E-02

A1   0.2561E-01 ± 0.8986E-01

Restricted
Range

4
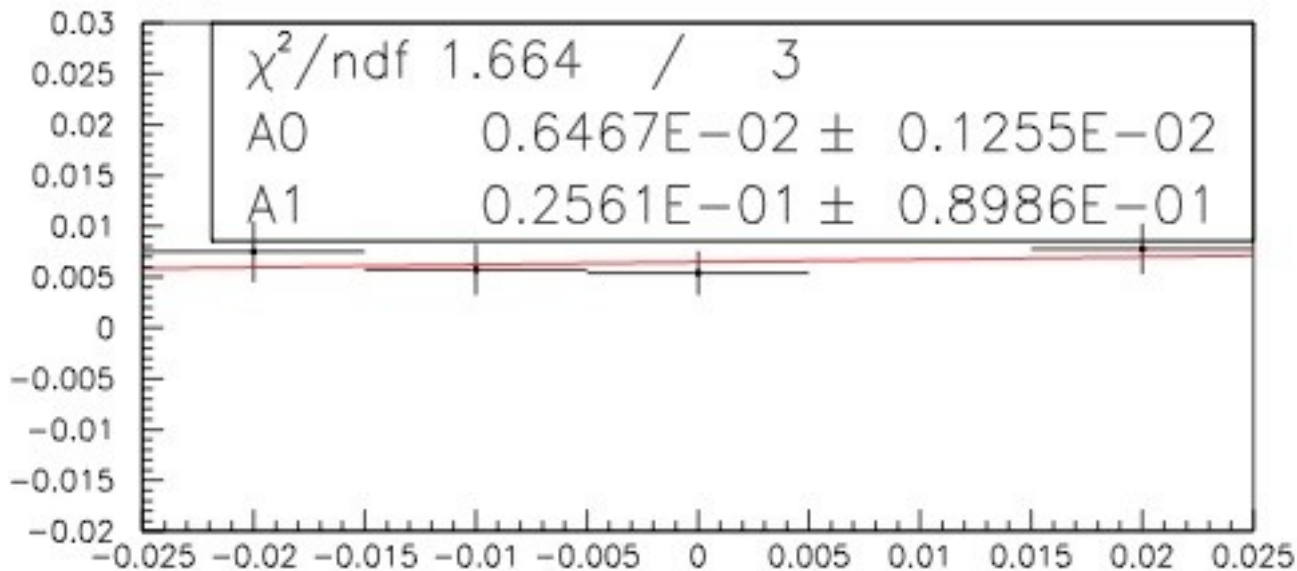
Toy Monte Carlo

- Previous problem of huge spread of the results was due to correlations between variables not correctly taken into account in the randomization process

Nominal Result

Likelihood Scan

Toy Monte Carlo

Likelihood Scan: $(5.52 \pm 0.95)\ 10^{-3}$

Nominal Fit: $(5.38 \pm 0.80)\ 10^{-3}$

Toy Average: $(6.76 \pm 0.91)\ 10^{-3}$

Toy Pull: 1.167

- Toy-Nominal $\approx 1.38\ 10^{-3}$ (1.5); Toy-Scan $\approx 1.24\ 10^{-3}$ (1.3) OK

- (Toy) $\approx 0.91/1.026 \approx 0.89$ (Pseudo exp. have 95% the statistics of Data Sample)

- (Fit) X Pull ≈ 0.93 in good agreement with (Scan)

  → Double Counting Effect does not affect the result (?)

Systematics

New determinations:

- Analysis Bias: $(\text{Fit}_{MC}) \times \text{Toy Pull} = 0.46 \cdot 10^{-3} \times 1.167 \approx 0.54 \cdot 10^{-3}$

- CP-eigenstates parameterization (Ceff, Seff varied by their statistical error from MC) = negligible

- Sample composition determined by external fit by floating D**, D*, Combinatorial & assuming Continuum from rescaled Offpeak, CP-eigenstates from MC and B+/B0 fraction from MC.

  → D**, D*, Combinatorial varied exploiting covariance matrix (biggest assumed as systematic error) $1.09 \, 10^{-3}$

  → CP fraction varied by ±50% $0.31 \, 10^{-3}$

  → B+/B0 combinatorial BKG varied by ±10%

  → Offpeak statistical error taken into account in the fit

Preliminary Systematics

Source	$\Delta|q/p|$
Combinatorial	$\pm 1.09 \times 10^{-3}$
D^{**}	$\pm 0.78 \times 10^{-3}$
D^*	$\pm 0.44 \times 10^{-3}$
Peaking Background	$^{+0.22}_{-0.96} \times 10^{-3}$
B^- Combinatorial Fraction	$\pm ? \times 10^{-3}$
CP-eigenstates	-0.31×10^{-3}
Total	$^{+?}_{-?} \times 10^{-3}$

Systematics from Sample Composition Without B- Combinatorial Fraction: δ≈+1.11/~1.49

Table 11: Systematic uncertainties on $|q/p|$.

Source	$\Delta|q/p|$
D_{tag} description	$^{+1.30}_{-0.31} \times 10^{-3}$
$\Delta\epsilon_{Rec}$	$\pm 0.02 \times 10^{-3}$
$\Delta\epsilon_{Tag}$	$\pm 0.06 \times 10^{-3}$
Resolution	$+0.60 \times 10^{-3}$
Analysis bias	$\pm 0.54 \times 10^{-3}$
Sample composition	$^{+?}_{-?} \times 10^{-3}$
CP-eigenstates parameterization	-
Total	$^{+?}_{-?} \times 10^{-3}$

| Table of Systematics hout B- Combinatorial ction: δ≈+1.89/~1.72