

Angular resolution systematics

Alessio Boletti, **Stefano Lacaprara**,

`stefano.lacaprara@pd.infn.it`

INFN Padova

P5p meeting,
no meeting, 19 April 2016

- Compare fit with only **right-tag** after all selection with RECO-level angles and with GEN-level angles.
- Same fit procedure, same initial parameters, etc. , only the angles change (reco vs gen).
- **New wrt 30/3: using initial parameter from Linwei**

Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.9974e-01	7.2783e-01	4.40e-03	0.186079
P1S	-4.3476e-01	1.7009e-02	3.00e-02	0.093894
P5pS	-1.6291e-01	3.4283e-01	1.32e-02	0.205682

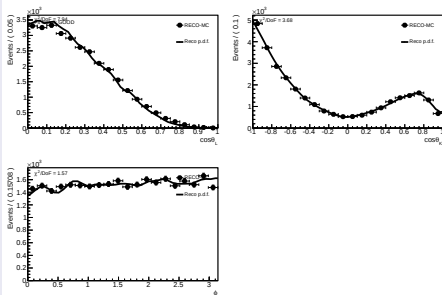
RooFitResult: minimized FCN value: 36750.5, estimated distance to minimum: 0.0158229 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Gen quantities

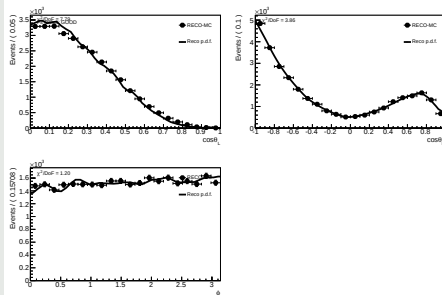
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.9974e-01	7.2817e-01	4.35e-03	0.126258
P1S	-4.3476e-01	2.4693e-02	2.99e-02	0.106589
P5pS	-1.6291e-01	3.4260e-01	1.31e-02	0.163921

RooFitResult: minimized FCN value: 37007.5, estimated distance to minimum: 0.0264148 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.8044e-01	8.0570e-01	7.49e-04	0.371459
P1S	6.6163e-01	-9.1010e-02	4.91e-02	0.998363
P5pS	-3.7043e-01	-3.3411e-01	8.31e-02	0.998375

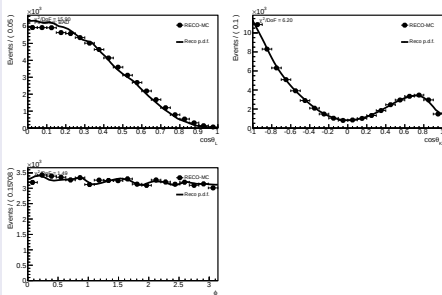
RooFitResult: minimized FCN value: 81606.4, estimated distance to minimum: 0.8121 covariance matrix quality: Full matrix, but forced positive-definite Status : MINIMIZE=-1 HESSE=3

Gen quantities

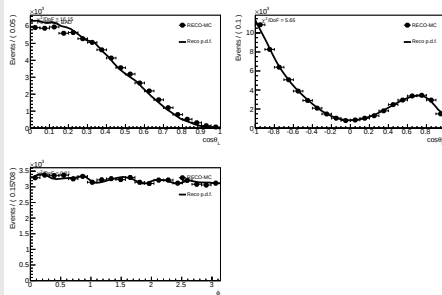
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.8044e-01	8.0603e-01	2.69e-03	0.110320
P1S	6.6163e-01	-9.4388e-02	2.66e-02	0.085440
P5pS	3.7043e-01	-3.3353e-01	9.84e-03	0.132666

RooFitResult: minimized FCN value: 81926.4, estimated distance to minimum: 0.154613 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	4.9861e-01	7.2318e-01	5.56e-04	0.012720
P1S	-6.3543e-01	-1.5495e-01	8.38e-03	0.027510
P5pS	-5.6063e-01	-7.3353e-01	1.37e-03	0.029089

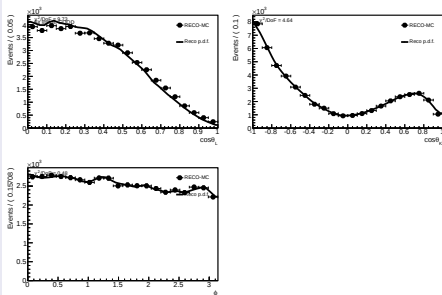
RooFitResult: minimized FCN value: 70993.2, estimated distance to minimum: 542.395 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Gen quantities

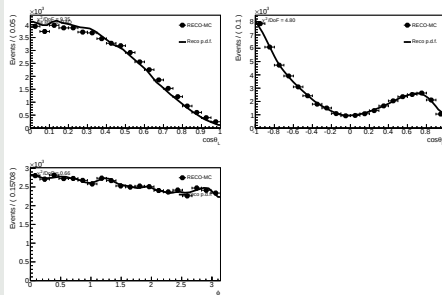
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	4.9861e-01	7.2106e-01	5.79e-01	0.998625
P1S	-6.3543e-01	-1.2010e-01	2.75e-02	0.997990
P5pS	-5.6063e-01	-7.3713e-01	2.42e-03	0.996645

RooFitResult: minimized FCN value: 71240.5, estimated distance to minimum: 736939 covariance matrix quality: Full matrix, but forced positive-definite Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.9974e-01	6.0009e-01	2.36e-03	0.165810
P1S	-4.3476e-01	-1.5326e-01	1.15e-02	0.172527
P5pS	-1.6291e-01	-8.6781e-01	5.07e-03	0.225611

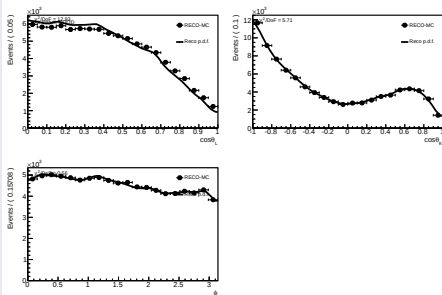
RooFitResult: minimized FCN value: 138737, estimated distance to minimum: 0.0032484 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Gen quantities

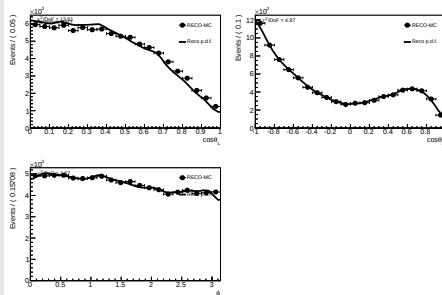
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.9974e-01	6.0066e-01	5.45e-03	0.992959
P1S	-4.3476e-01	-1.4521e-01	7.54e-02	0.997009
P5pS	-1.6291e-01	-8.6880e-01	3.75e-02	0.998099

RooFitResult: minimized FCN value: 139174, estimated distance to minimum: 12.2764 covariance matrix quality: Full matrix, but forced positive-definite Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.3732e-01	5.2313e-01	3.24e-03	0.047249
P1S	0.0000e+00	-1.5044e-01	2.83e-01	0.998918
P5pS	7.6739e-03	-9.1238e-01	2.97e-02	0.998918

RooFitResult:

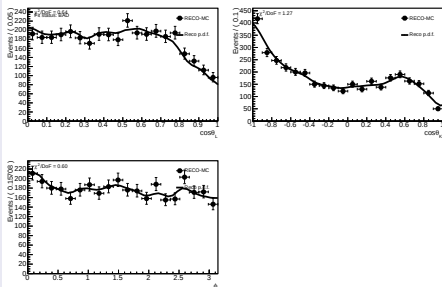
minimized FCN value: 5140.21, estimated distance to minimum: 3.47655e-05
 covariance matrix quality: Full matrix, but forced positive-definite Status :
 MINIMIZE=-1 HESSE=3

Gen quantities

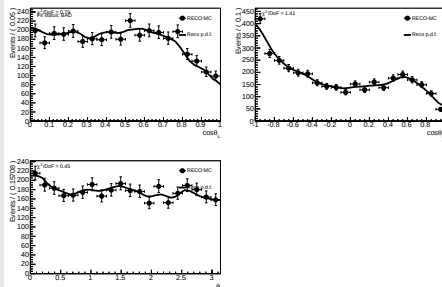
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.3732e-01	5.2262e-01	7.21e-04	0.655460
P1S	0.0000e+00	-1.7870e-01	1.33e-03	0.710440
P5pS	7.6739e-03	-9.0691e-01	1.93e-04	0.710437

RooFitResult: minimized FCN value: 5188.76, estimated distance to minimum:
 8.91485e-05 covariance matrix quality: Full, accurate covariance matrix Status :
 MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.5748e-01	4.4730e-01	2.00e-03	0.043211
P1S	8.0087e-02	-2.3504e-01	6.00e-03	0.276511
P5pS	-7.4430e-01	-8.6614e-01	3.48e-03	0.279147

RooFitResult:

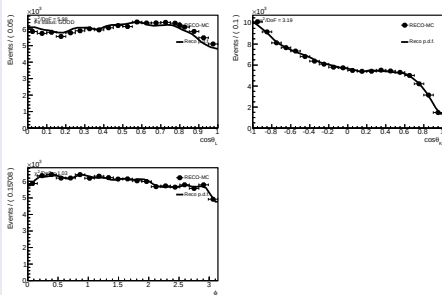
minimized FCN value: 195847, estimated distance to minimum: 0.00186366
 covariance matrix quality: Full, accurate covariance matrix Status :
 MINIMIZE=0 HESSE=0

Gen quantities

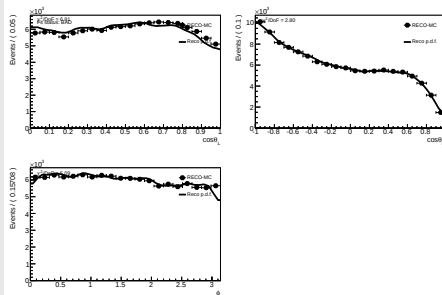
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.5748e-01	4.4956e-01	6.63e-04	0.091521
P1S	8.0087e-02	-2.1899e-01	7.98e-03	0.390863
P5pS	-7.4430e-01	-8.6952e-01	4.22e-03	0.387929

RooFitResult: minimized FCN value: 196572, estimated distance to minimum:
 0.0918506 covariance matrix quality: Full, accurate covariance matrix Status :
 MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.3816e-01	3.9196e-01	3.19e-04	0.002123
P1S	0.0000e+00	-3.4174e-01	4.83e-02	0.423371
P5pS	4.3802e-02	-8.1161e-01	2.28e-02	0.423373

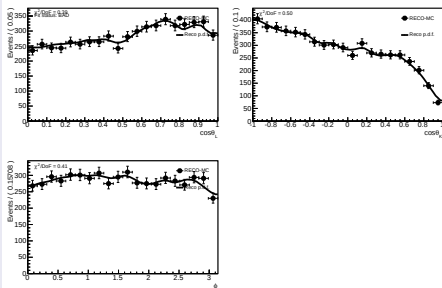
RooFitResult: minimized FCN value: 8644.06, estimated distance to minimum: 0.830482 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Gen quantities

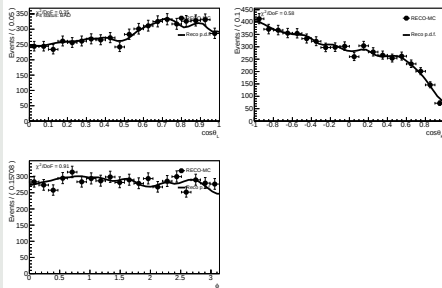
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.3816e-01	3.9277e-01	3.19e-02	0.998573
P1S	0.0000e+00	-2.7268e-01	4.63e-03	0.976675
P5pS	4.3802e-02	-8.5314e-01	1.24e-02	0.998653

RooFitResult: minimized FCN value: 8743.37, estimated distance to minimum: 0.00744293 covariance matrix quality: Full matrix, but forced positive-definite Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	3.1564e-01	3.6201e-01	6.01e-04	0.010171
P1S	3.9344e-02	-4.1805e-01	7.03e-03	0.374732
P5pS	-8.0440e-01	-7.6143e-01	5.98e-03	0.374631

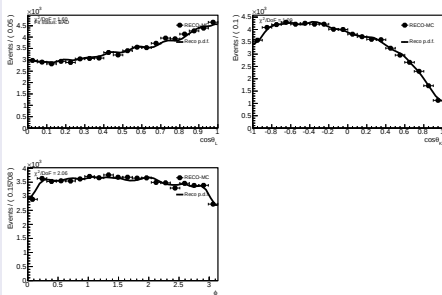
RooFitResult: minimized FCN value: 115709, estimated distance to minimum: 0.259296 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Gen quantities

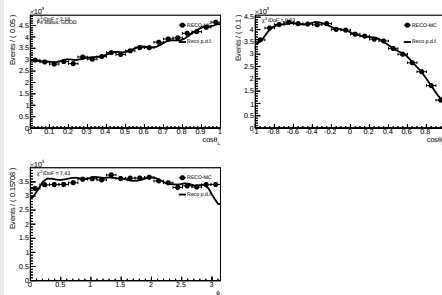
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	3.1564e-01	3.6243e-01	2.63e-03	0.015914
P1S	3.9344e-02	-3.9501e-01	6.85e-04	0.027395
P5pS	-8.0440e-01	-7.6428e-01	5.88e-03	0.030800

RooFitResult: minimized FCN value: 116693, estimated distance to minimum: 0.0656338 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error
FIS	9.5748e-01 3.3969e-01 +/- 2.66e-03 0.032159		
P1S	8.0087e-02 -6.1145e-01 +/- 1.06e-02 0.626965		
P5pS	-7.4430e-01 -6.1614e-01 +/- 6.46e-03 0.626742		

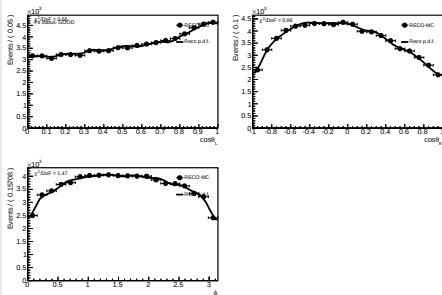
RooFitResult: minimized FCN value: 124124, estimated distance to minimum: 0.00249139 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Gen quantities

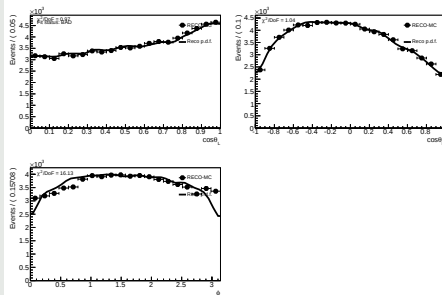
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	9.5748e-01	3.4201e-01	6.44e-04	0.034964
P1S	8.0087e-02	-5.4773e-01	2.32e-03	0.060017
P5pS	-7.4430e-01	-6.2174e-01	3.81e-03	0.065038

RooFitResult: minimized FCN value: 125918, estimated distance to minimum: 0.025764 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Comparing fit results on RECO angles with GEN angles all at RECO level.

q^2 bin	ΔF_L	ΔP_1	$\Delta P'_5$
$\Delta = RECO - GEN$			
0	$-3.40 \cdot 10^{-4}$	$-7.68 \cdot 10^{-3}$	$2.30 \cdot 10^{-4}$
1	$-3.30 \cdot 10^{-4}$	$3.38 \cdot 10^{-3}$	$-5.80 \cdot 10^{-4}$
2	$2.12 \cdot 10^{-3}$	$-3.49 \cdot 10^{-2}$	$3.60 \cdot 10^{-3}$
3	$-5.70 \cdot 10^{-4}$	$-8.05 \cdot 10^{-3}$	$9.90 \cdot 10^{-4}$
4	$5.10 \cdot 10^{-4}$	$2.83 \cdot 10^{-2}$	$-5.47 \cdot 10^{-3}$
5	$2.26 \cdot 10^{-3}$	$-1.61 \cdot 10^{-2}$	$3.38 \cdot 10^{-3}$
6	$-8.10 \cdot 10^{-4}$	$-6.91 \cdot 10^{-2}$	$4.15 \cdot 10^{-2}$
7	$-4.20 \cdot 10^{-4}$	$-2.30 \cdot 10^{-2}$	$-2.85 \cdot 10^{-3}$
8	$-2.32 \cdot 10^{-3}$	$-6.37 \cdot 10^{-2}$	$5.60 \cdot 10^{-3}$

Additional or backup slides



Bibliography I

