

Angular resolution systematics

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P5p meeting,
vidyo, 30 march 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).

Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	7.2196e-01	7.2750e-01	5.41e-03	0.602427
P1S	1.4088e-02	2.0211e-02	3.51e-02	0.527569
P5pS	3.4472e-01	3.4258e-01	1.40e-02	0.697091

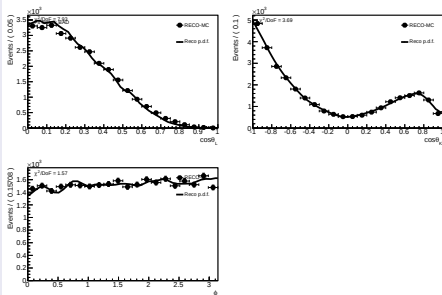
RooFitResult: minimized FCN value: 36750.4, estimated distance to minimum: 0.123104 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Gen quantities

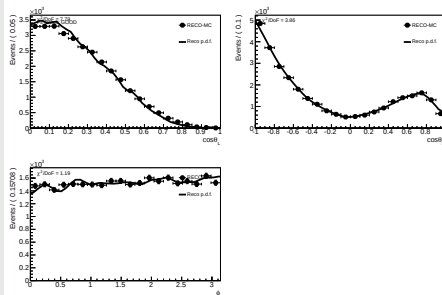
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	7.2196e-01	7.2804e-01	4.35e-03	0.128850
P1S	1.4088e-02	2.2834e-02	3.08e-02	0.255416
P5pS	3.4472e-01	3.4226e-01	1.34e-02	0.283072

RooFitResult: minimized FCN value: 37007.5, estimated distance to minimum: 0.403041 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	7.9899e-01	8.0627e-01	9.97e-03	0.998972
P1S	-8.8556e-02	-9.5231e-02	9.84e-02	0.998940
P5pS	-3.4102e-01	-3.3377e-01	5.69e-04	0.967945

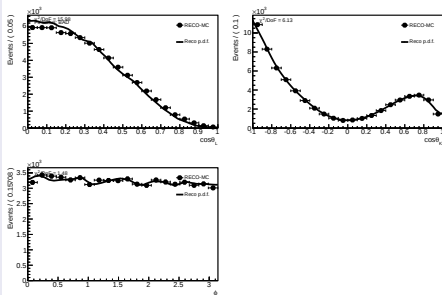
RooFitResult: minimized FCN value: 81606.4, estimated distance to minimum: 0.0758955 covariance matrix quality: Full matrix, but forced positive-definite
Status : MINIMIZE=-1 HESSE=3

Gen quantities

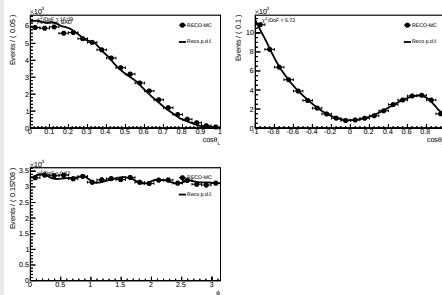
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	7.9899e-01	8.0558e-01	3.05e-03	0.998384
P1S	-8.8556e-02	-9.0101e-02	4.86e-02	0.998377
P5pS	-3.4102e-01	-3.3178e-01	1.20e-03	0.998415

RooFitResult: minimized FCN value: 81926.4, estimated distance to minimum: 1442.37 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	7.1720e-01	7.2089e-01	6.32e-04	0.974899
P1S	-1.2089e-01	-1.2284e-01	1.18e-02	0.976107
P5pS	-7.3664e-01	-7.3705e-01	3.46e-03	0.916156

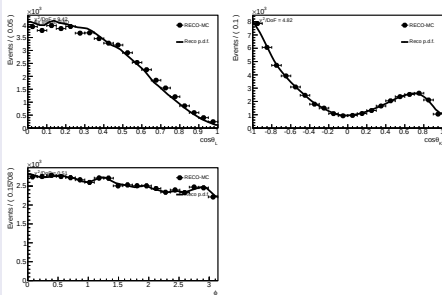
RooFitResult: minimized FCN value: 70992.4, estimated distance to minimum: 0.000822829 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Gen quantities

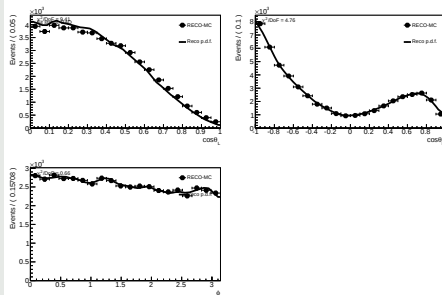
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	7.1720e-01	7.2152e-01	2.92e-03	0.225007
P1S	-1.2089e-01	-1.1940e-01	2.16e-02	0.241322
P5pS	-7.3664e-01	-7.3842e-01	8.57e-03	0.288202

RooFitResult: minimized FCN value: 71240.4, estimated distance to minimum: 308.429 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=1 HESSE=1

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.9808e-01	6.0009e-01	2.28e-03	0.153780
P1S	-1.5650e-01	-1.5146e-01	1.22e-02	0.350002
P5pS	-8.7295e-01	-8.6843e-01	5.36e-03	0.376768

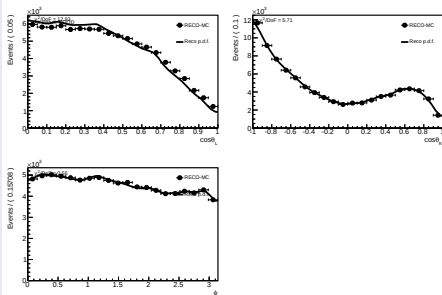
RooFitResult: minimized FCN value: 138737, estimated distance to minimum: 0.0152967 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Gen quantities

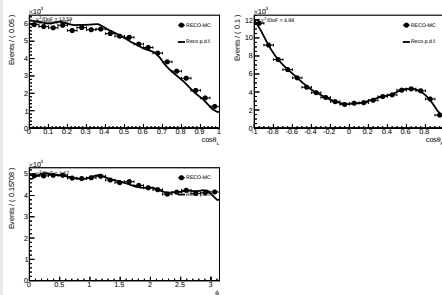
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.9808e-01	6.0061e-01	2.29e-03	0.170906
P1S	-1.5650e-01	-1.4392e-01	1.19e-02	0.319534
P5pS	-8.7295e-01	-8.6935e-01	5.33e-03	0.354874

RooFitResult: minimized FCN value: 139174, estimated distance to minimum: 0.268796 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.3732e-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

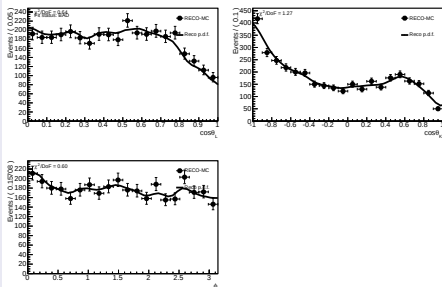
RooFitResult: minimized FCN value: 5140.21, estimated distance to minimum: 3.47655e-05 covariance matrix quality: Full matrix, but forced positive-definite
Status : MINIMIZE=-1 HESSE=3

Gen quantities

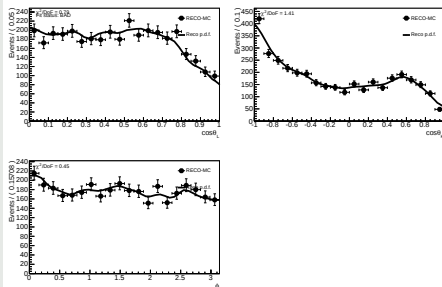
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.3732e-01	5.2262e-01	7.21e-04	0.655460
P1S	0.0000e+00	-1.7870e-01	1.33e-03	0.710440
P5pS	7.6739e-03	-9.0691e-01	1.93e-04	0.710437

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	4.4648e-01	4.4737e-01	2.00e-03	0.060352
P1S	-2.3242e-01	-2.3485e-01	9.14e-03	0.574508
P5pS	-8.7383e-01	-8.6661e-01	4.66e-03	0.575755

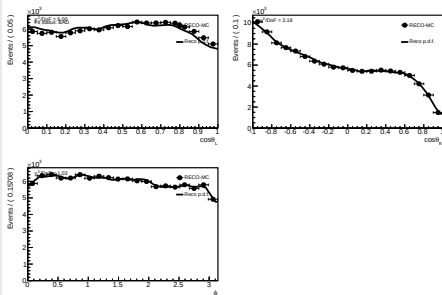
RooFitResult: minimized FCN value: 195847, estimated distance to minimum: 0.00176773 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=1 HESSE=1

Gen quantities

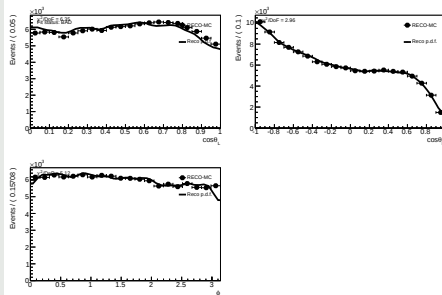
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	4.4648e-01	4.4770e-01	1.98e-03	0.036439
P1S	-2.3242e-01	-2.2121e-01	6.26e-03	0.259568
P5pS	-8.7383e-01	-8.6791e-01	4.00e-03	0.261742

RooFitResult: minimized FCN value: 196573, estimated distance to minimum: 0.0037334 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

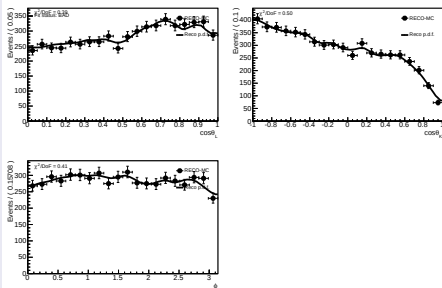
RooFitResult: minimized FCN value: 8644.06, estimated distance to minimum: 0.830482 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Gen quantities

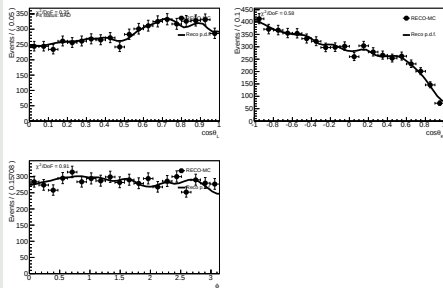
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	5.3816e-01	3.9277e-01	3.19e-02	0.998573
P1S	0.0000e+00	-2.7268e-01	4.63e-03	0.976675
P5pS	4.3802e-02	-8.5314e-01	1.24e-02	0.998653

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	3.6127e-01	3.6041e-01	2.69e-03	0.020181
P1S	-4.3180e-01	-4.2905e-01	1.07e-02	0.545165
P5pS	-7.5271e-01	-7.5603e-01	6.55e-03	0.545020

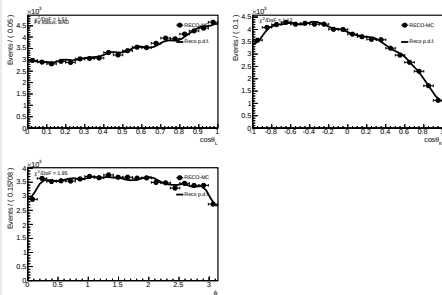
RooFitResult: minimized FCN value: 115710, estimated distance to minimum: 0.650687 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=1 HESSE=1

Gen quantities

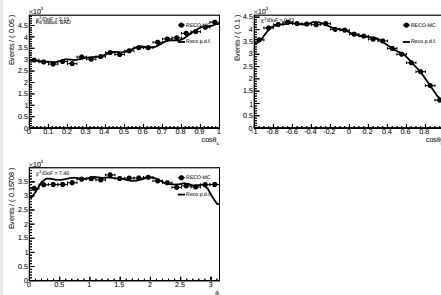
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	3.6127e-01	3.6197e-01	2.70e-03	0.004086
P1S	-4.3180e-01	-3.9496e-01	2.66e-03	0.104522
P5pS	-7.5271e-01	-7.6228e-01	1.18e-03	0.104488

RooFitResult: minimized FCN value: 116693, estimated distance to minimum: 0.0223521 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities



Reco quantities

Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	3.3850e-01	3.3976e-01	2.66e-03	0.004637
P1S	-6.0586e-01	-6.1145e-01	8.87e-03	0.356771
P5pS	-6.1749e-01	-6.1618e-01	5.38e-03	0.356793

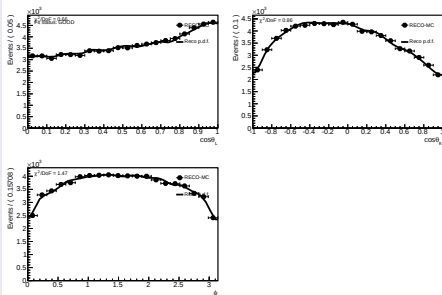
RooFitResult: minimized FCN value: 124124, estimated distance to minimum: 0.00188606 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=0 HESSE=0

Gen quantities

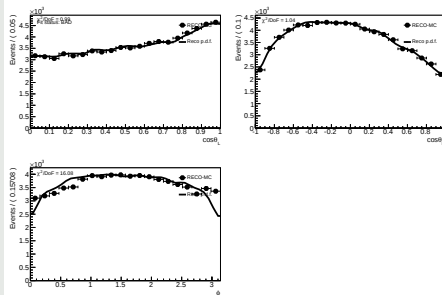
Parameter	InitialValue	FinalValue	Error	GblCorr
FIS	3.3850e-01	3.4238e-01	6.25e-06	0.000000
P1S	-6.0586e-01	-5.4606e-01	9.03e-06	0.000001
P5pS	-6.1749e-01	-6.2270e-01	1.05e-05	0.000001

RooFitResult: minimized FCN value: 125918, estimated distance to minimum: 2.71493e-07 covariance matrix quality: Full, accurate covariance matrix Status : MINIMIZE=-1 HESSE=3

Reco quantities



Gen quantities

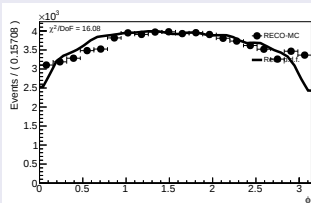
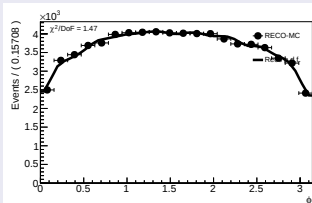


Comparing fit results on RECO angles with GEN angles all at RECO level.

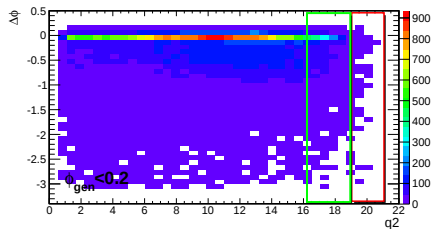
q^2 bin	ΔF_L	%	ΔP_1	%	$\Delta P'_5$	%
$\Delta = RECO - GEN, \% = \Delta / RECO $						
0	$-5.40 \cdot 10^{-4}$	0.07	$-2.62 \cdot 10^{-3}$	12.96	$3.20 \cdot 10^{-4}$	0.09
1	$6.90 \cdot 10^{-4}$	0.09	$-5.13 \cdot 10^{-3}$	5.39	$-1.99 \cdot 10^{-3}$	0.60
2	$-6.30 \cdot 10^{-4}$	0.09	$-3.44 \cdot 10^{-3}$	2.80	$1.37 \cdot 10^{-3}$	0.19
3	$-5.20 \cdot 10^{-4}$	0.09	$-7.54 \cdot 10^{-3}$	4.98	$9.20 \cdot 10^{-4}$	0.11
4	$5.10 \cdot 10^{-4}$	0.10	$2.83 \cdot 10^{-2}$	18.81	$-5.47 \cdot 10^{-3}$	0.60
5	$-3.30 \cdot 10^{-4}$	0.07	$-1.36 \cdot 10^{-2}$	5.79	$1.30 \cdot 10^{-3}$	0.15
6	$-8.10 \cdot 10^{-4}$	0.21	$-6.91 \cdot 10^{-2}$	20.22	$4.15 \cdot 10^{-2}$	5.11
7	$-1.56 \cdot 10^{-3}$	0.43	$-3.41 \cdot 10^{-2}$	7.95	$6.25 \cdot 10^{-3}$	0.83
8	$-2.62 \cdot 10^{-3}$	0.77	$-6.54 \cdot 10^{-2}$	10.70	$6.52 \cdot 10^{-3}$	1.06

Resolution vs q^2 for high and low ϕ

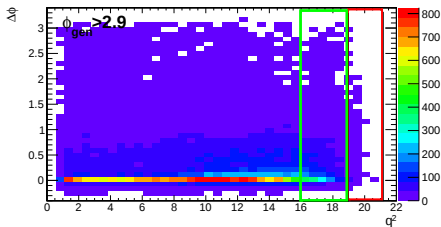
Bin #8: RECO angles (left), GEN angles (right)



$\phi_{\text{gen}} < 0.2$



$\phi_{\text{gen}} > 2.9$



$\Delta\phi (= \phi_{\text{GEN}} - \phi_{\text{RECO}})$ vs q^2 . RED box: bin #8 GREEN box: bin #7

Additional or backup slides



Bibliography I

