MisTag fraction systematic

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systematics for MisTag Fraction

Procedure

- I used Alessio's code for the fit, latest version;
- modify **MisTagFraction** by ± 1 *sigma* with respect the central value;
- The σ is the one obtained comparing mc results with fit on data on J/ψ control region: $\sigma = 0.008$
  - This σ is larger that the one obtained from MC statistics only $\sigma \sim 0.002$ for all the bins
  - Use the same $\sigma = 0.008$ for all the q^2 bins
- run standard fit using 100 random initial values
- free parameters: A_s^5, P_1, P_5' *nBkgComb*, *nSig*
- consider only successfull fits and take the one with lowest `fnc`;
- compare the results with the same fit done with **MisTagFraction** central value;
- Differences are systematic uncertainties for MisTagFraction

Summary

Taking as systematic uncertainty **half** the difference of the fit results between `MisTag` $+1\sigma$ and `MisTag` -1σ, the grand summary would be the following.

Bin	A_s^5	P_1	P_5'
0	0.0	0.037	0.0002
1	0.00002	0.025	0.012
2	0.0037	0.010	0.0030
3	0.015	0.0066	0.0076
5	0.50	0.0010	0.0067
7	0.00025	0.0029	0.0017
8	0.048	0.011	0.0003

Not actual error on A_s^5, but on the fitting parameter

Still waiting Alessio for conversion to actual A_s^5 values...

Bin	$\Delta(+1\sigma, central)$	$\Delta(central, -1\sigma)$	$\Delta(+1\sigma, -1\sigma)/2$
0	0.0000	-0.0000	0.00000
1	0.00002	-0.0001	0.00002
2	0.1048	-0.0973	0.00375
3	0.0238	-0.0054	0.01460
5	0.4521	-1.4550	0.50146
7	0.00002	-0.0005	0.00025
8	0.3599	-0.2630	0.04846

Not actual error on A_s^5, but on the fitting parameter

P_1

Bin	$\Delta(+1\sigma, central)$	$\Delta(central, -1\sigma)$	$\Delta(+1\sigma, -1\sigma)/2$
0	0.0049	-0.0786	0.0369
1	0.0362	-0.0144	0.0253
2	0.0025	-0.0223	0.0099
3	0.0019	-0.0151	0.0066
5	0.0262	-0.0242	0.0010
7	0.0003	-0.0062	0.0029
8	0.0638	-0.0419	0.0110

Bin	$\Delta(+1\sigma, central)$	$\Delta(central, -1\sigma)$	$\Delta(+1\sigma, -1\sigma)/2$
0	0.0016	-0.0012	0.0002
1	0.0170	-0.0067	0.0119
2	0.0282	-0.0342	0.0030
3	0.0029	-0.0181	0.0076
5	0.0257	-0.0390	0.0067
7	0.0002	-0.0035	0.0017
8	0.0058	-0.0064	0.0003

Additional stuff

Additional or backup slides

Bibliography I