Results for profiled FC for $B^0 \to K^\star \mu\mu$

Stefano Lacaprara

stefano.lacaprara@pd.infn.it

INFN Padova

no meeting,
work, January 30, 2017

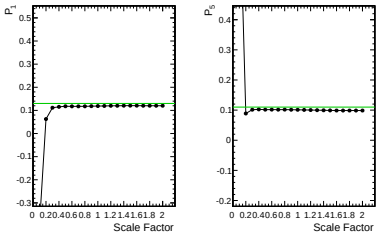
Evaluation of best fit

To get the best fit we have different possibilities: we start from the scan of the P_1 P_5' plane and look at the $\mathcal{L}$, evaluated at each point with a fit which leave free Y_S^C, Y_B , and A_S^5

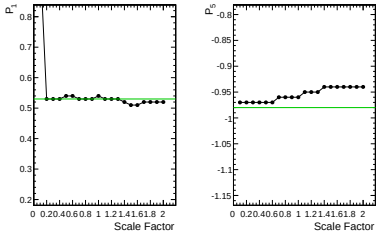
- how we take the best value?

1. take the absolute maximum of the $\mathcal{L}$;
   - × not robust if a upward fluctuation of the $\mathcal{L}$ happens in some bin close to the real maximum;
   - × problem if the maximum is in a sparse region;
2. perform a bivariate gaus fit and take the results of the fit;
   - ✓ find the max inside the physical region
   - ✓ more robust against fluctuation of the $\mathcal{L}$
   - ? which range of the P_1 P_5' plane to include in the fit?
   - Check if there is any dependence on the fit range
   - Fit range: $(\pm 1\sigma \cdot \text{ScaleFactor})$ around center
     - ⋆ center is absolute maximum
     - ⋆ σ is that computed with FC
     - ⋆ ScaleFactor $\in [0.1, 2]$

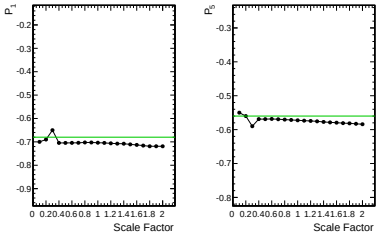
Bin 0



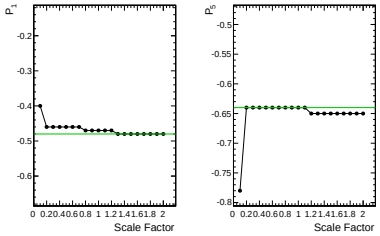
Bin 2



Bin 1



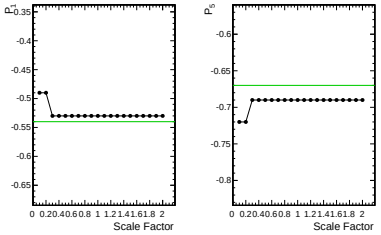
Bin 3



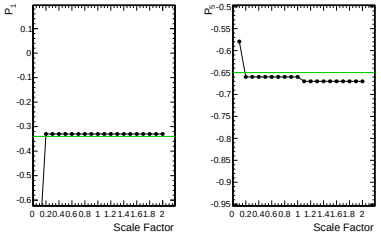
NB: Vertical axis range is 68% CL range according to FC, namely the statistical uncertainty

Green line is the value of absolute minimum of DLL

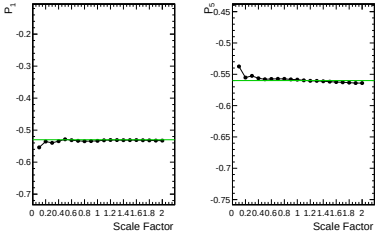
Bin 5



Bin 7



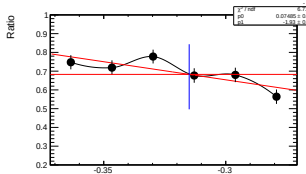
Bin 8



NB: Vertical axis range is 68% CL range according to FC, namely the statistical uncertainty

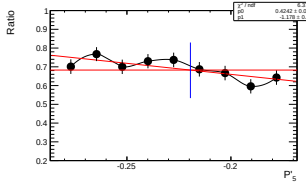
Green line is the value of absolute minimum of DLL

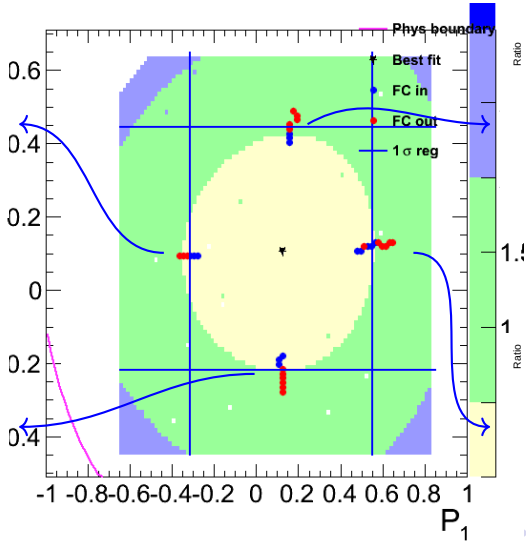
Bin 0

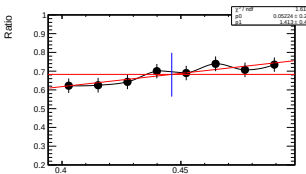


Done

Done

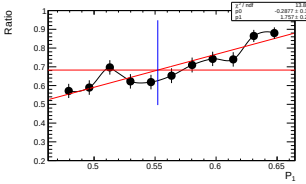




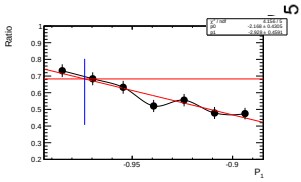


Done

Done

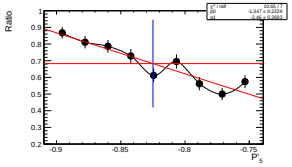


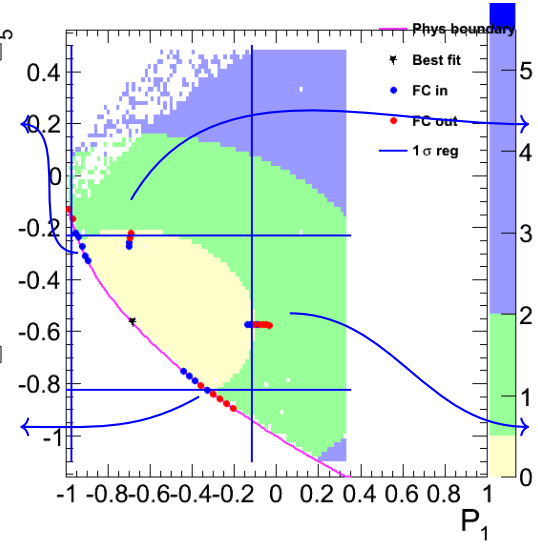
Bin 1

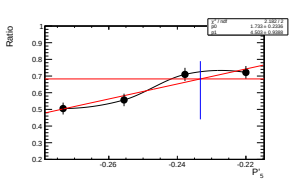


Done

Done

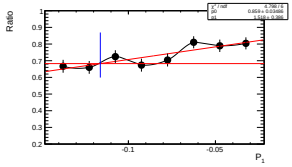




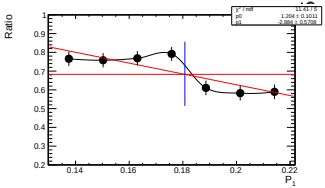


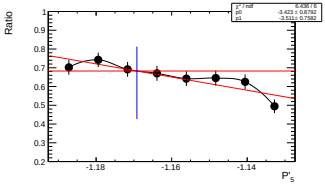
Done

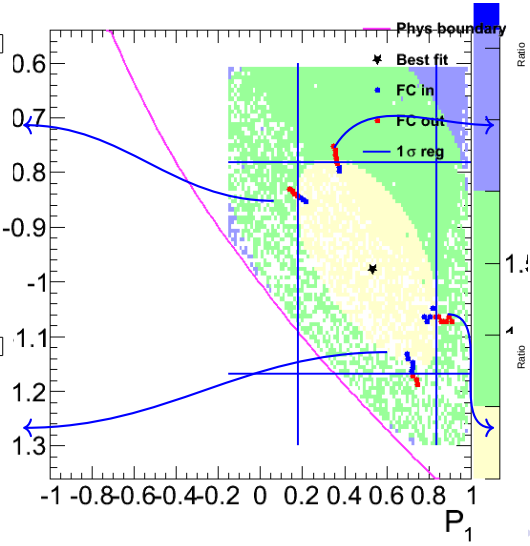
Done

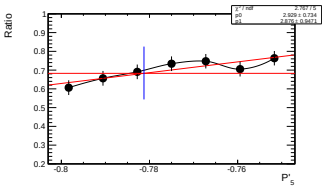


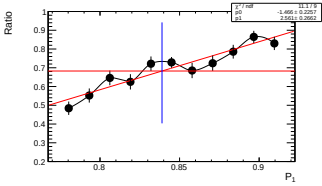
Bin 2











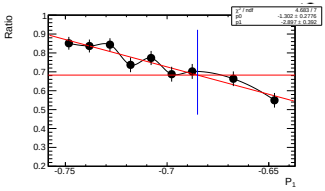
Done

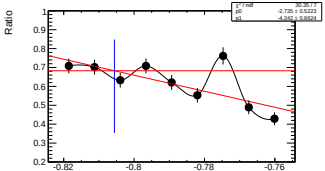
Done

Done

Done

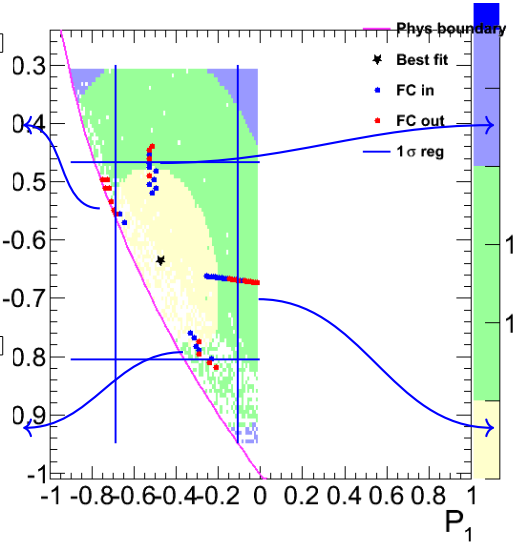
Bin 3

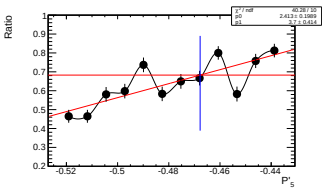


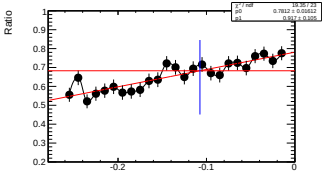


Done

Done



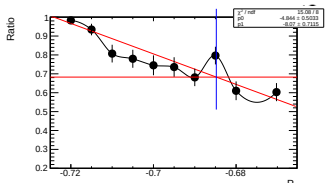


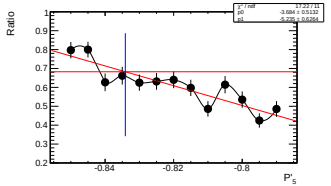


Done

Done

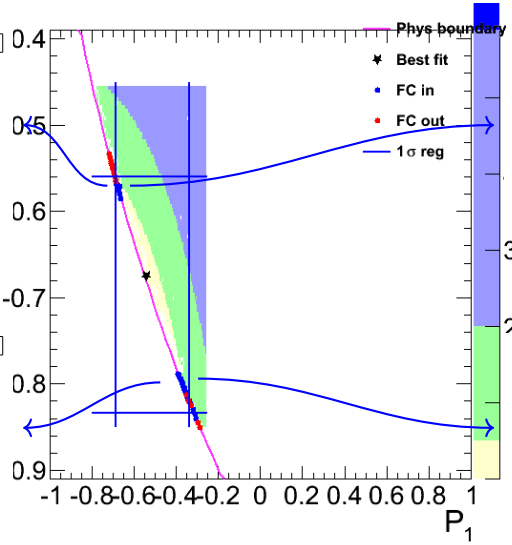
Bin 5

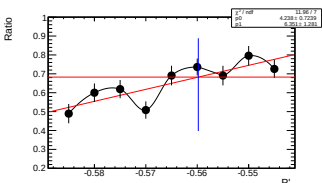




Done

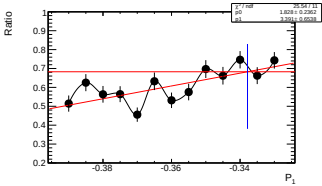
Done



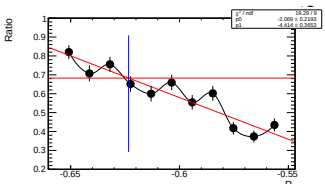


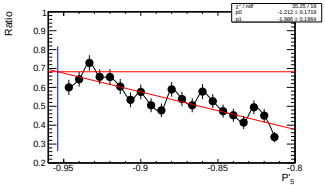
Done

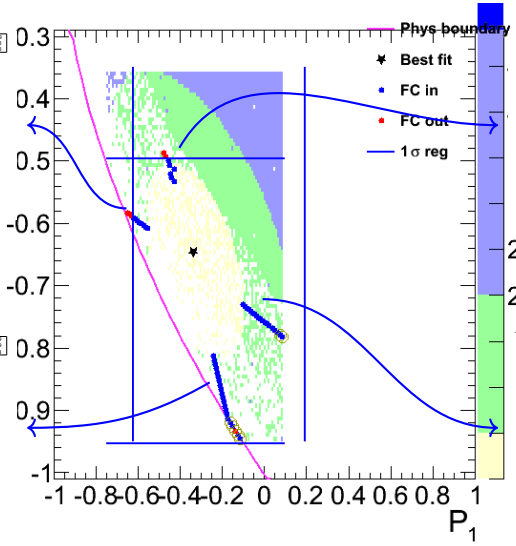
Done

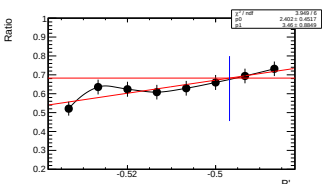


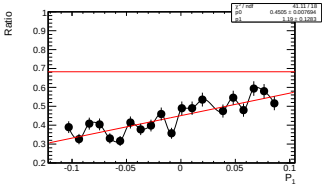
Bin 7







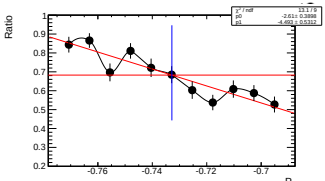




Done
Maybe?

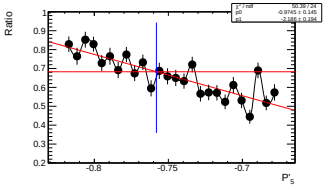
Done
No

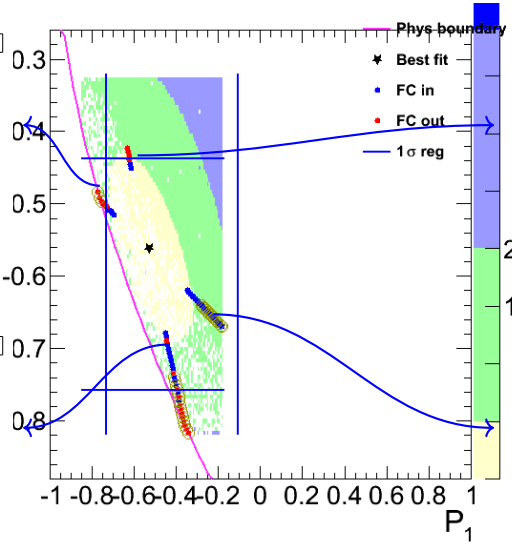
Bin 8

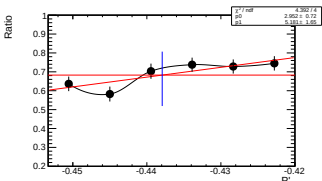


Done

Done

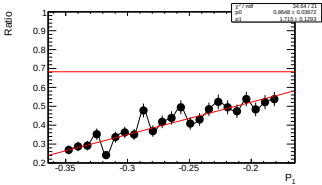






Done

No



Summary of results

Results and confidence level (68%)

	P_1			P_5'		
Bin	Abs	Fit		Abs	Fit	
0	0.13	0.119	$^{+0.43}_{-0.44}$	0.11	0.101	$^{+0.34}_{-0.33}$
1	−0.68	−0.704	$^{+0.57}_{-0.29}$	−0.56	−0.573	$^{+0.33}_{-0.26}$
2	0.53	0.54	$^{+0.30}_{-0.35}$	−0.98	−0.96	$^{+0.20}_{-0.19}$
3	−0.48	−0.47	$^{+0.37}_{-0.21}$	−0.64	−0.64	$^{+0.17}_{-0.17}$
5	−0.54	−0.53	$^{+0.20}_{-0.14}$	−0.67	−0.69	$^{+0.11}_{-0.16}$
7	−0.34	−0.33	$^{+0.53}_{-0.28}$	−0.65	−0.66	$^{+0.15}_{-0.31}$
8	−0.53	−0.534	$^{+0.42}_{-0.2}$	−0.56	−0.559	$^{+0.12}_{-0.2}$

The values in red are still preliminary, in blue to be checked.

- **Abs** is the value for with the DLL has the absolute minimum, among the scanned points in the P_1, P_5' plane where the DLL is available;
- **Fit** is the value of the center of the bivariate gaussian fit, performed on a rectangular $\pm 1\sigma$ in the P_1, P_5' plane.

Comparison with $\Delta \log \mathcal{L} = 0.5$

Results and confidence level $\Delta \log \mathcal{L} = 0.5$

Bin	P_1	FC	CM	Hyb	P_5'	FC	CM	Hyb
0	0.12	$^{+0.43}_{-0.44}$	$^{+0.44}_{-0.463}$	$^{+0.42}_{-0.447}$	0.10	$^{+0.34}_{-0.33}$	$^{+0.313}_{-0.333}$	$^{+0.313}_{-0.333}$
1	−0.70	$^{+0.57}_{-0.29}$	$^{+0.59}_{-0.267}$	$^{+0.537}_{-0.25}$	−0.57	$^{+0.33}_{-0.26}$	$^{+0.35}_{-0.29}$	$^{+0.35}_{-0.29}$
2	0.54	$^{+0.30}_{-0.35}$	$^{+0.333}_{-0.36}$	$^{+0.297}_{-0.32}$	−0.96	$^{+0.20}_{-0.19}$	$^{+0.23}_{-0.163}$	$^{+0.23}_{-0.163}$
3	−0.47	$^{+0.37}_{-0.21}$	$^{+0.307}_{-0.25}$	$^{+0.283}_{-0.23}$	−0.64	$^{+0.17}_{-0.17}$	$^{+0.18}_{-0.183}$	$^{+0.18}_{-0.183}$
5	−0.53	$^{+0.20}_{-0.14}$	$^{+0.153}_{-0.137}$	$^{+0.16}_{-0.14}$	−0.69	$^{+0.11}_{-0.16}$	$^{+0.097}_{-0.12}$	$^{+0.107}_{-0.123}$
7	−0.33	$^{+0.53}_{-0.28}$	$^{+0.257}_{-0.23}$	$^{+0.25}_{-0.227}$	−0.66	$^{+0.15}_{-0.31}$	$^{+0.143}_{-0.17}$	$^{+0.143}_{-0.17}$
8	−0.53	$^{+0.42}_{-0.2}$	$^{+0.217}_{-0.21}$	$^{+0.207}_{-0.2}$	−0.56	$^{+0.12}_{-0.2}$	$^{+0.137}_{-0.143}$	$^{+0.137}_{-0.143}$

Additional stuff

Additional or backup slides

Bibliography I