

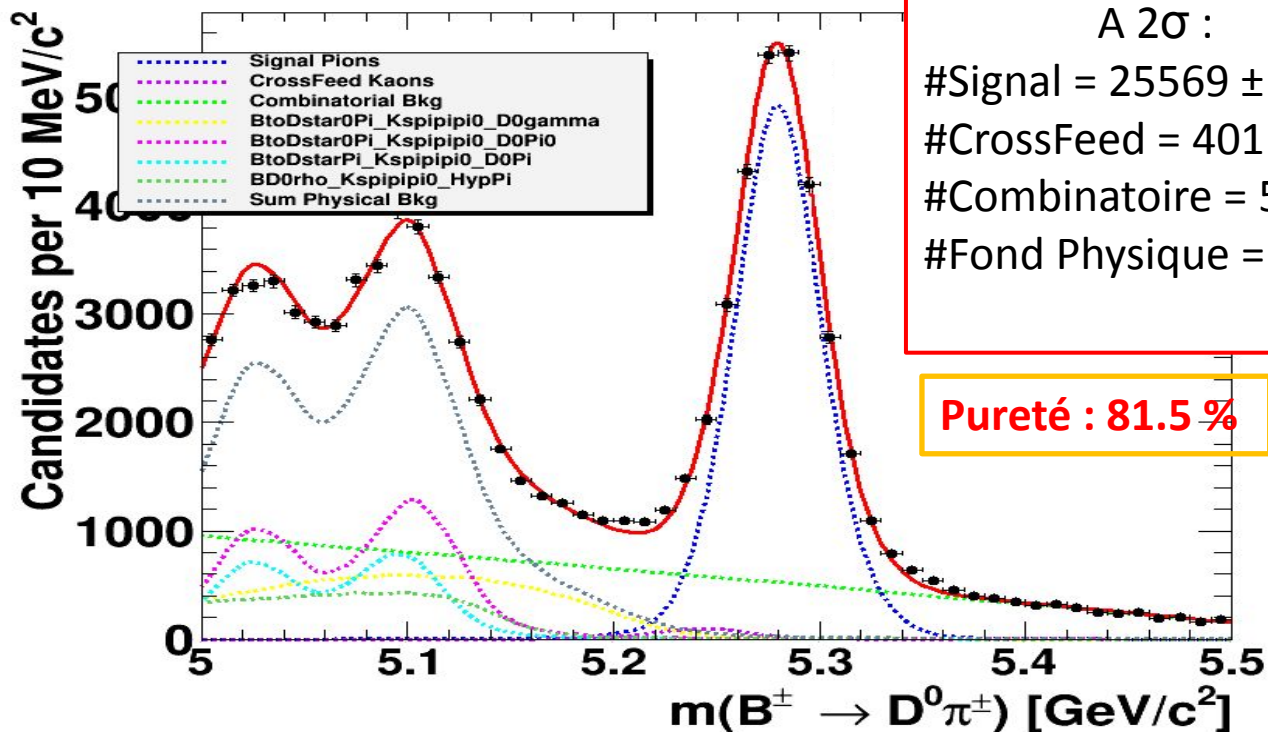
Update on the analysis

$$B^{\pm} \rightarrow D^0 \{K_s^0 \pi^+ \pi^- \pi^0\} K^-$$

Jessy Daniel

LPC LHCb Group Meeting – 10 May 2022

- Fits have been improved since last time



A 2σ :

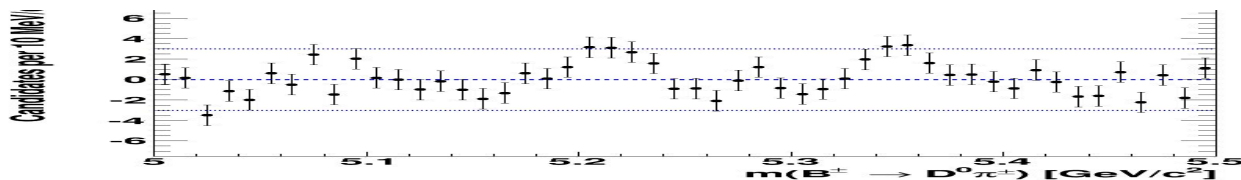
#Signal = 25569 ± 180

#CrossFeed = 401 ± 13

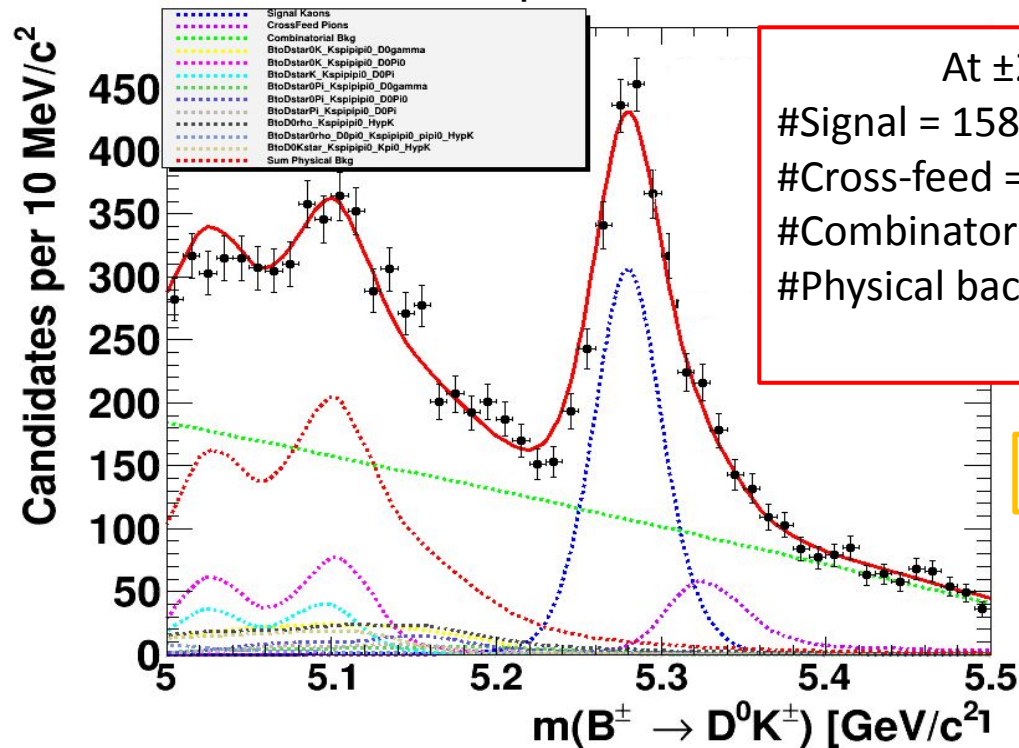
#Combinatoire = 5130 ± 101

#Fond Physique = 288 ± 2

Pureté : 81.5 %



- Fits have been improved since last time



At $\pm 2\sigma$:

#Signal = 1586 ± 59

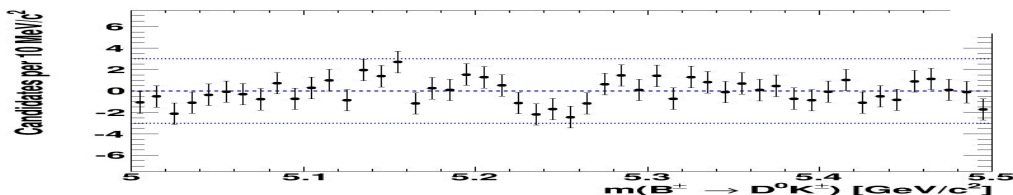
#Cross-feed = 181 ± 2

#Combinatorial background = 1054 ± 43

#Physical background = 94 ± 6

Purity : 54.4 %

Belle: 815 ± 51 events
60% purity



As the purity isn't that good, I tried to do some variations in my selection to improve it :

WARNING : this study has been made with another way to fit so “reference” purity is different that the one calculated now

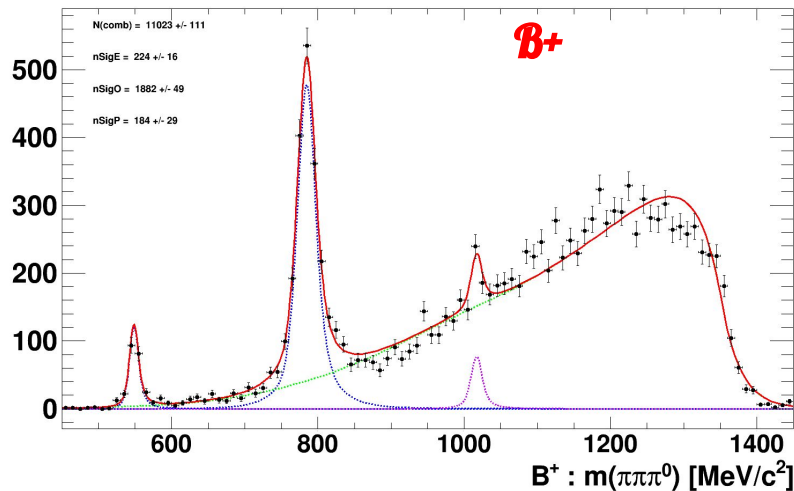
Selection modification	New Statistics DK at 2σ	Variation Statistics DK at 2σ	New purity at 2σ	Purity at 2σ Variation
REFERENCE	1602	+0 %	58.7 %	+ 0%
Lower cut on M(D0) from 1.827GeV to 1.842 GeV	1481	- 8%	61.5 %	+ 2.8 %
PID Cut On PIDK_DLL from 4 to 6	1413	- 12 %	62.1 %	+ 3.4 %
MVA1 and corresponding MVA2	1472	- 8 %	62.0 %	+ 3.3 %
Upper cut on M(D0) from 1.9GeV to 1.92GeV	1622	+ 1.2 %	54.3 %	- 4.4 %

None of those changes are interesting !!!

- Analysis of the $\pi^+\pi^-\pi^0$ resonances and first asymmetry measurement

Dpi

Candidates per 10 MeV



$$A_{\text{CP}} = [N(B^-) - N(B^+)] / \text{sum} \\ = (2.86 \pm 1.8) \% \\ \text{CPV}$$

ω

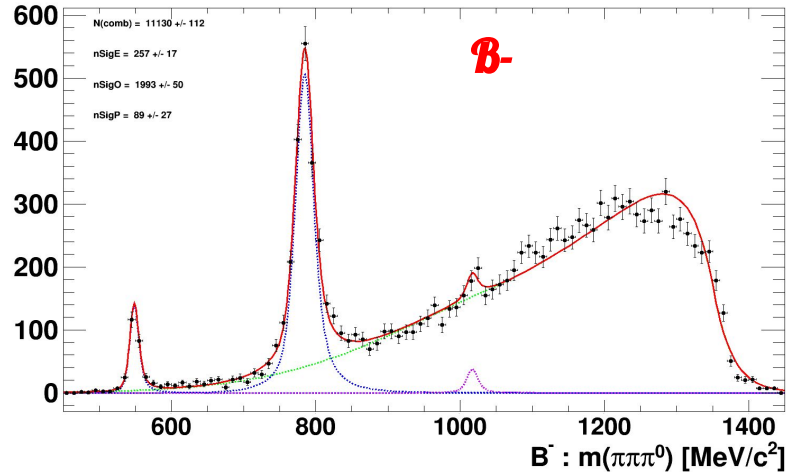
$$A_{\text{CP}} = [N(B^-) - N(B^+)] / \text{sum} \\ = (6.9 \pm 4.8) \% \\ \text{CPV}$$

η

$$A_{\text{CP}} = [N(B^-) - N(B^+)] / \text{sum} \\ = - (34.8 \pm 15.5) \% \\ \text{CPV}$$

ϕ

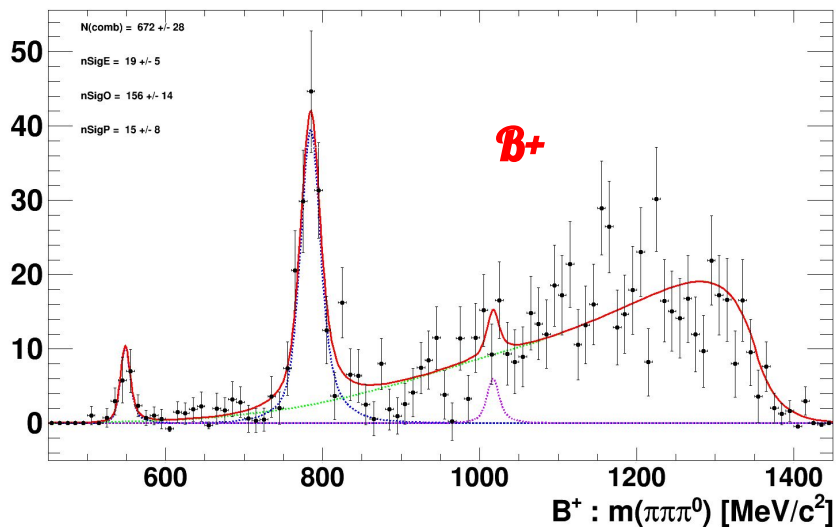
Candidates per 10 MeV



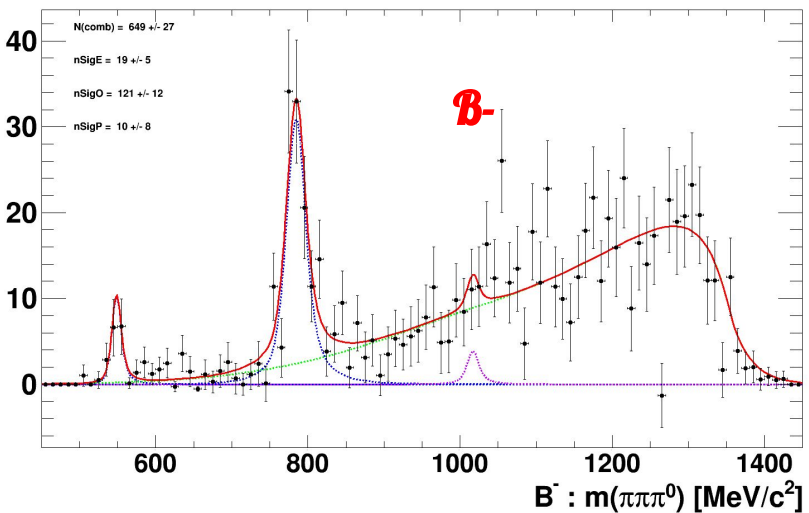
-> Here, only statistical uncertainty

DK

Candidates per 10 MeV



Candidates per 10 MeV



Reminder : BABAR $\rightarrow -8.9 \pm 6.6 \%$

$$A_{\text{CP}} = [N(B^-) - N(B^+)] / \text{sum} = - (12.6 \pm 6.5) \% \quad \text{CPV}$$

ω

$$A_{\text{CP}} = [N(B^-) - N(B^+)] / \text{sum} = (0.0 \pm ??) \% \quad \text{CPV}$$

η

$$A_{\text{CP}} = [N(B^-) - N(B^+)] / \text{sum} = - (20 \pm 45) \% \quad \text{CPV}$$

ϕ

\rightarrow Here, only statistical uncertainty

Thank you for your attention !!!