Background Fits for $\tau \to \mu\mu\mu$

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Preselection

The preliminary cuts before the fitting was performed:

1. Trigger decision:
   - L0Dec + Hlt1Dec + Hlt2Dec + cleaningcut
2. Particle Identification:
3. Mass Cuts:
   - $mass(p0p1) > 250 MeV$
   - $abs(mass(p0p2 - 1020 MeV)) > 20 MeV$
   - $abs(mass(p1p2 - 1020 MeV)) > 20 MeV$
4. τ mass cut:
   - $mass(\tau) \in (1600 - 1950) MeV$

Fitting

Fitting was done on two intervals:
$mass(\tau) \in ((1600, 1730) \cap (1810, 1950))MeV$
The following pdfs were fitted:

- Exponential.
- Linear.
- Second order polynomial.

NOTE:

Second order polynomiad was always in beetween Exp and Pol1, so i deleted it.

Binning

Values calculated using Pauls script:

Phys/Tau23Mu/scripts/fillmassbins.C

PID	Geo
−0.03	−1.0
−0.005	0.116
0.03	0.44
0.07	0.616
1	1.0

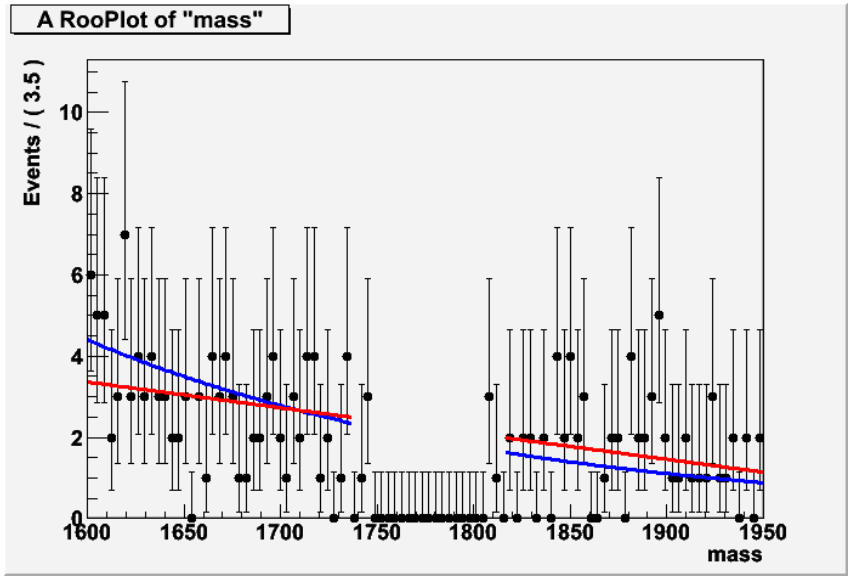
Please note colors in plots

Exponential Linear

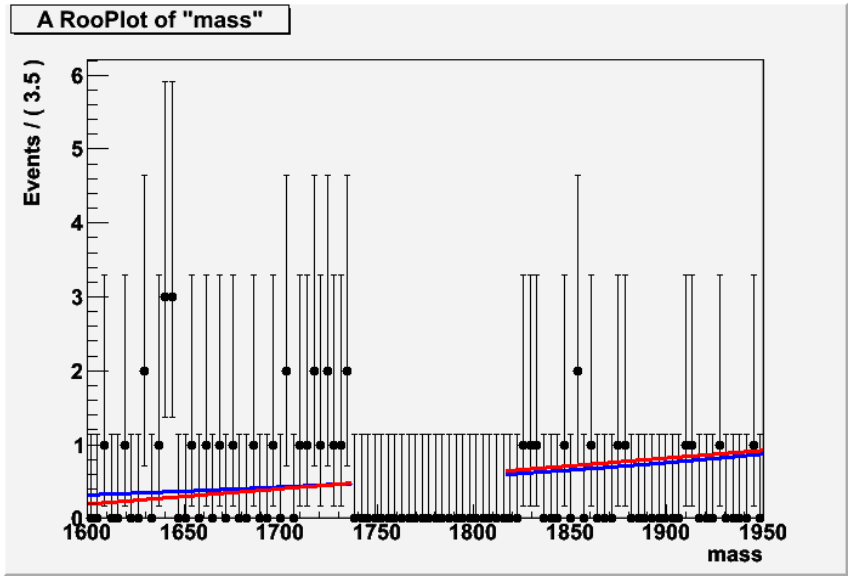
FITS

Please note colors in plots

Exponential , Linear



$Pid \in (0.005, 0.03)$,
$Geo \in (0.116, 0.44)$

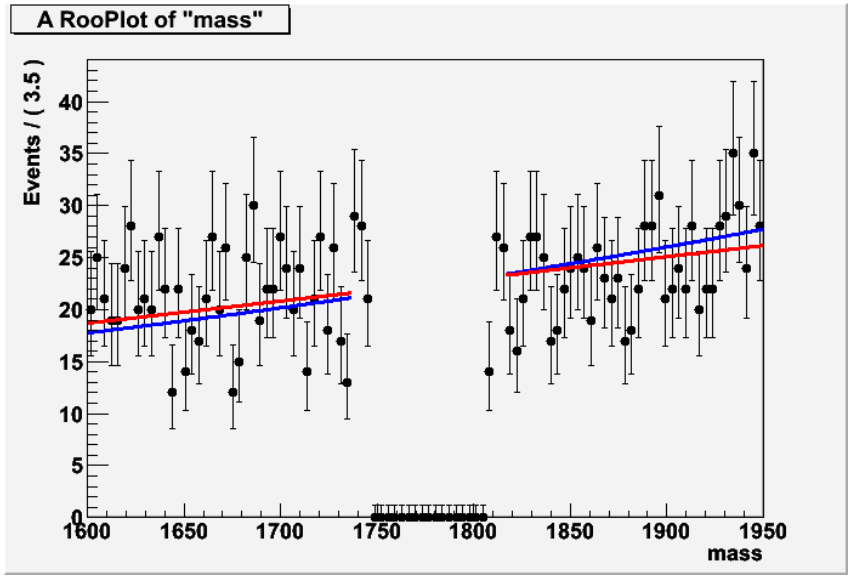


$Pid \in (0.005, 0.03)$,
$Geo \in (0.44, 0.616)$

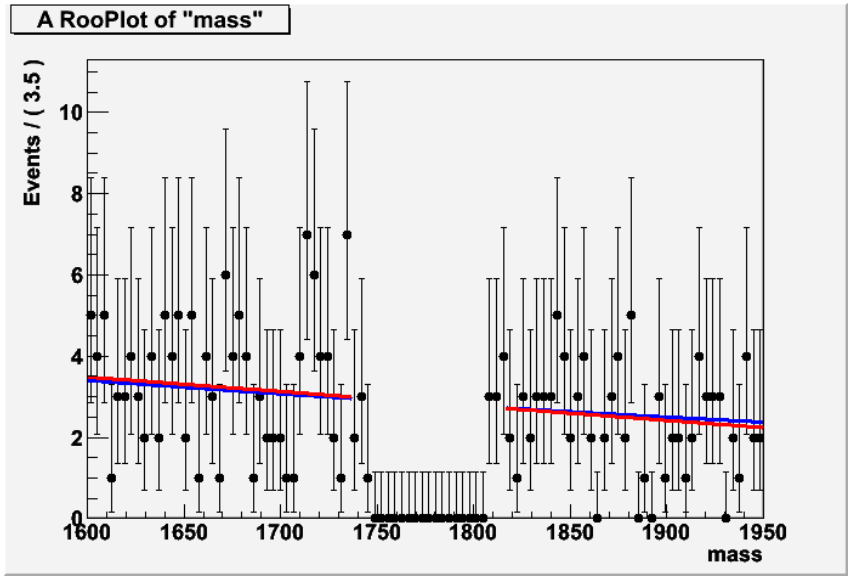
FITS

Please note colors in plots

Exponential , Linear



$Pid \in (0.005, 0.03),\ Geo \in (-1, 0.116)$

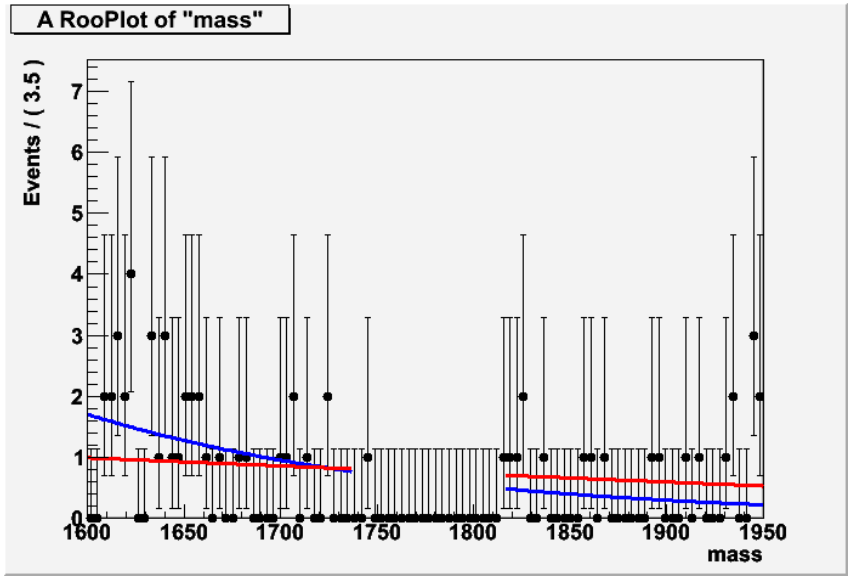


$Pid \in (-0.03, -0.005),$
$Geo \in (0.116, 0.44)$

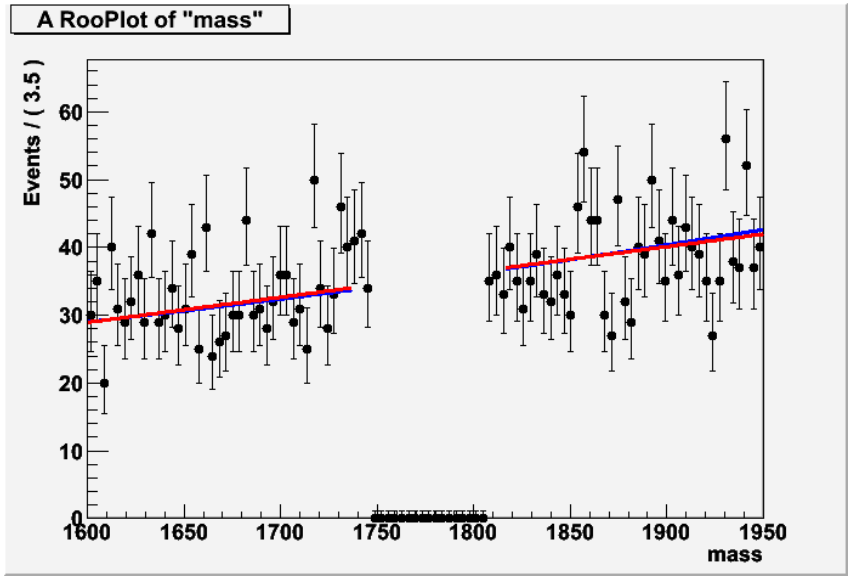
FITS

Please note colors in plots

Exponential , Linear



$Pid \in (-0.03, -0.005)$,
$Geo \in (0.44, 0.616)$

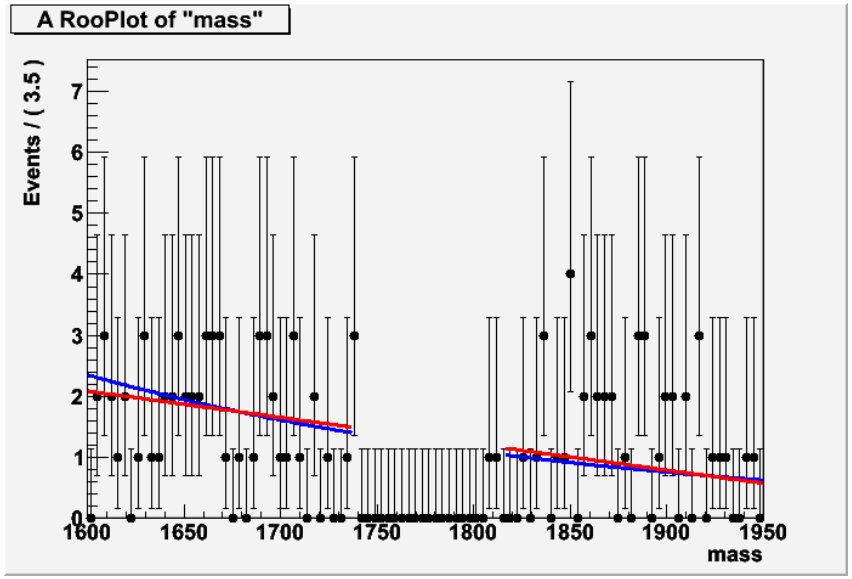


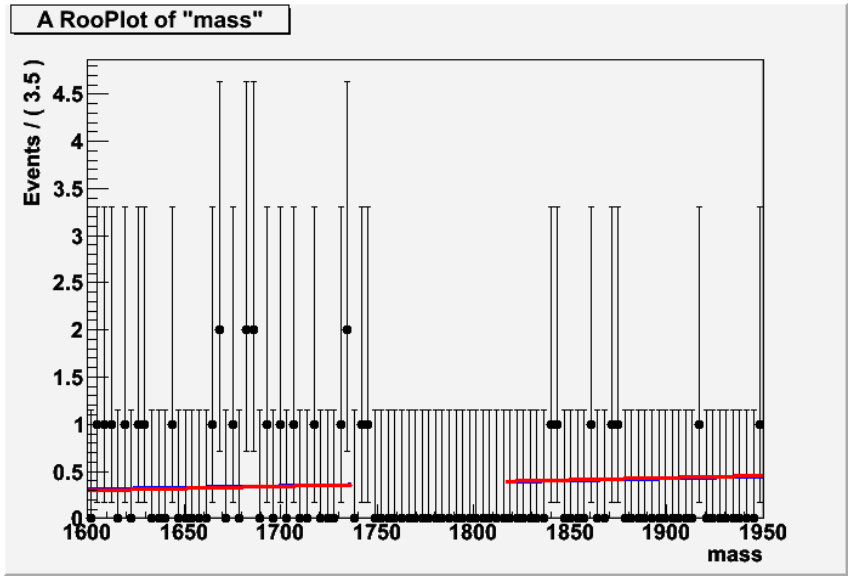
$Pid \in (-0.03, -0.005)$,
$Geo \in (-1, 0.116)$

FITS

Please note colors in plots

Exponential , Linear



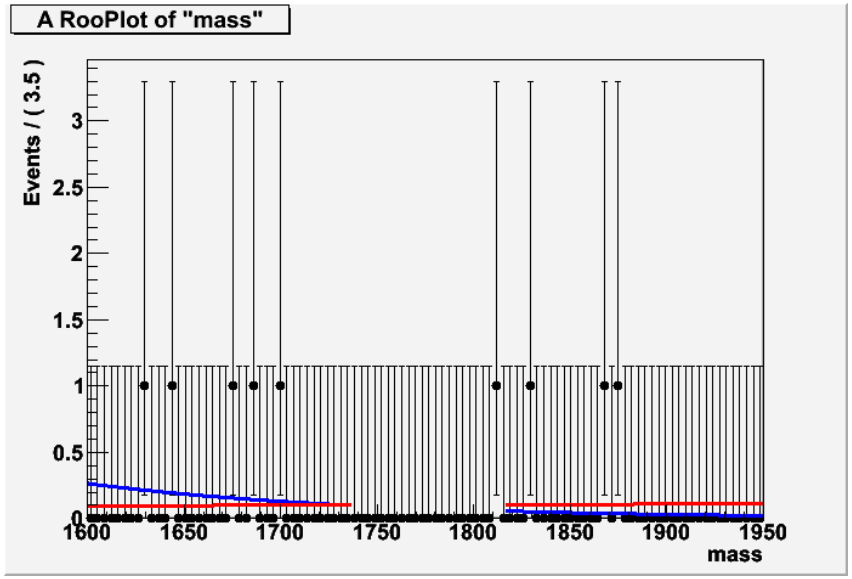


$Pid \in (0.03, 0.07)$, $Geo \in (0.116, 0.44)$ $Pid \in (0.03, 0.07)$, $Geo \in (0.44, 0.616)$

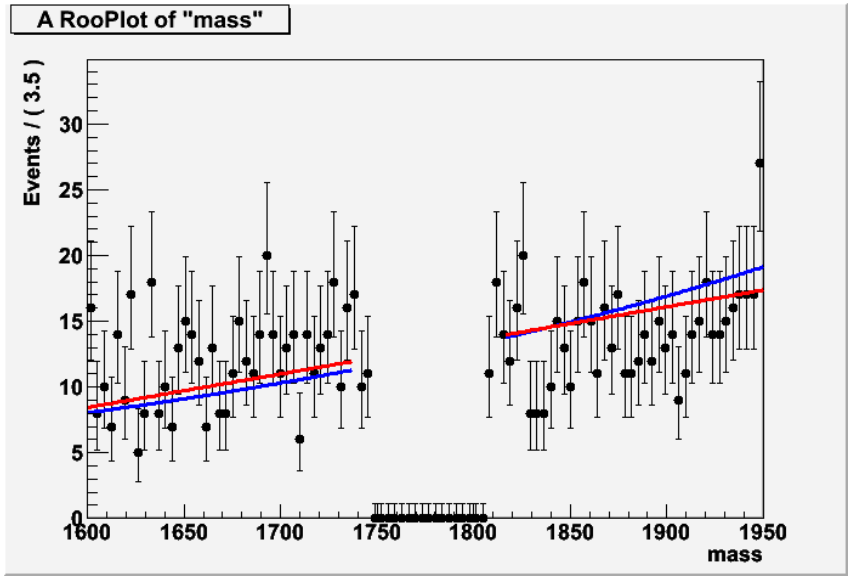
FITS

Please note colors in plots

Exponential , Linear



$Pid \in (0.03, 0.07),\ Geo \in (0.616, 1)$

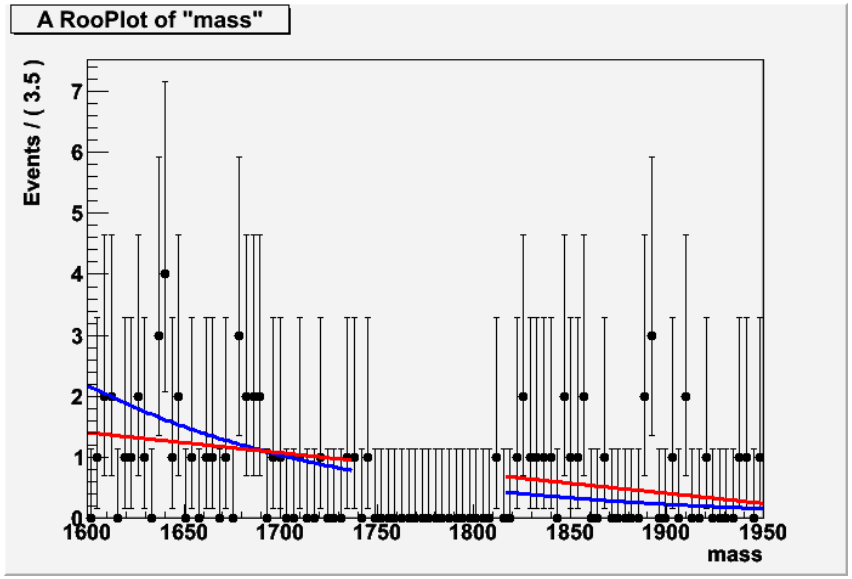


$Pid \in (0.03, 0.07),\ Geo \in (-1, 0.116)$

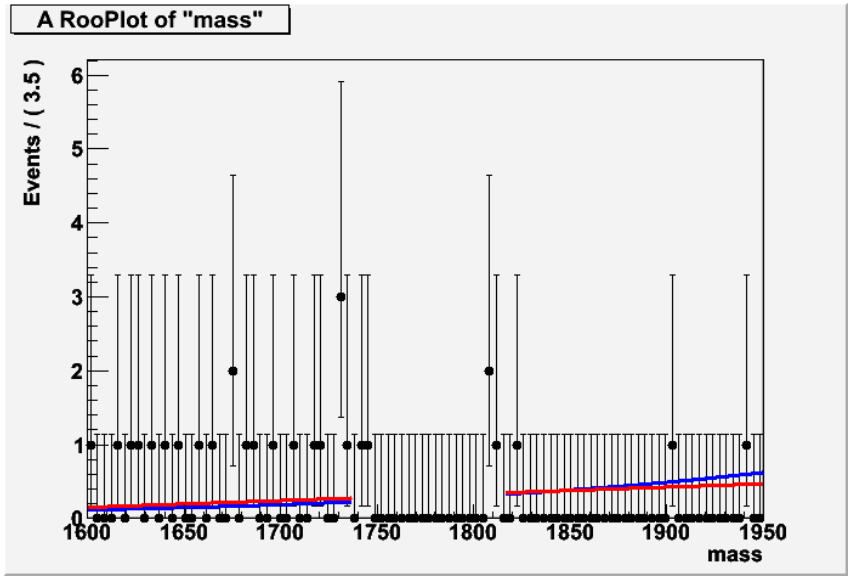
FITS

Please note colors in plots

Exponential , Linear



$Pid \in (0.07, 1),\ Geo \in (0.116, 0.44)$

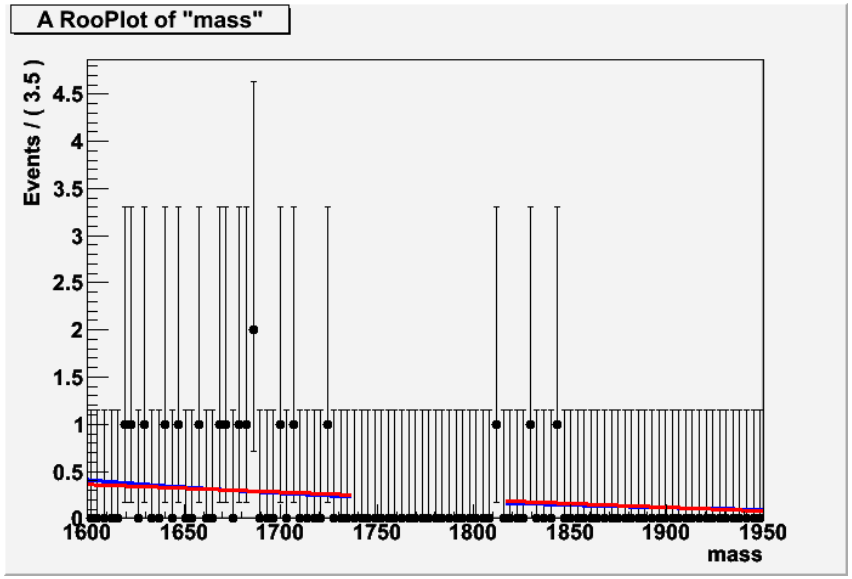


$Pid \in (0.07, 1),\ Geo \in (0.44, 0.616)$

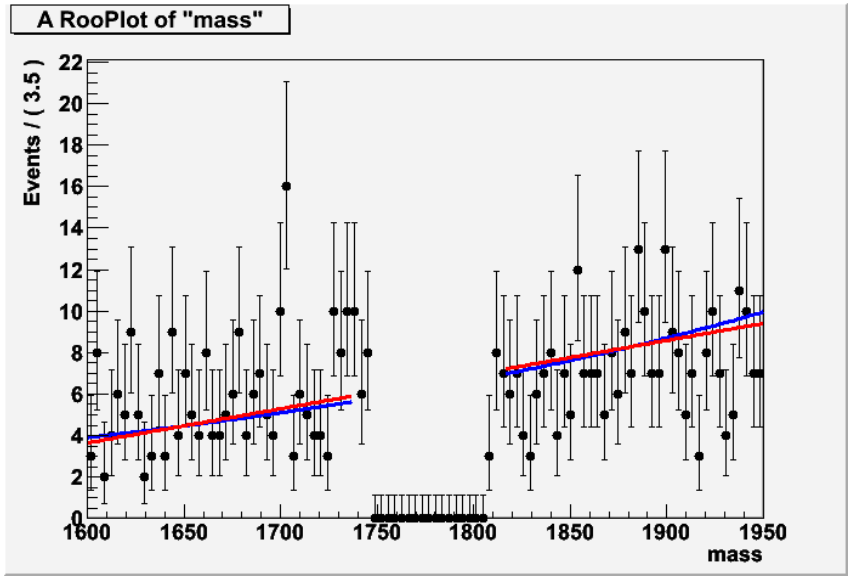
FITS

Please note colors in plots

Exponential , Linear



$Pid \in (0.07, 1),\ Geo \in (0.616, 1)$



$Pid \in (0.07, 1),\ Geo \in (-1, 0.116)$

Background estimation

Background was calculated for every region depending on the background fit.

PID	GL	Linear	Error lin	EXP	Error. Exp
0.03, 0.07	−1.0, 0.116	225.286975	3.720377	214.762667	6.453331
0.03, 0.07	0.116, 0.44	25.334704	0.730938	22.658613	3.382960
0.03, 0.07	0.440, 0.616	6.315243	0.557466	6.259470	0.429338
0.03, 0.07	0.616, 1.0	2.101699	0.879121	1.433717	1.249549
0.07, 1.0	−1.0, 0.1160	112.765871	3.022240	106.582612	4.852854
0.07, 1.0	0.116, 0.44	15.177247	0.424522	10.128789	3.232027
0.07, 1.0	0.440, 0.616	4.828111	0.422406	4.066456	1.435559
0.07, 1.0	0.616, 1.0	3.871274	1.701825	3.372127	1.346100

Background estimation 2

Background was calculated for every region depending on the background fit.

PID	GL	Linear	Error lin	EXP	Error. Exp
$-0.03, -0.005$	$-1.0, 0.116$	612.985455	4.573560	607.080395	4.679320
$-0.03, -0.005$	$0.116, 0.44$	46.384177	1.931014	46.008803	1.470308
$-0.03, -0.005$	$0.440, 0.616$	14.350158	0.839352	11.075469	3.081886
$-0.03, -0.005$	$0.616, 1.0$	5.339882	0.935613	2.725763	1.714949
$-0.005, 0.03$	$-1.0, 0.116$	395.550331	3.384968	390.678139	4.435397
$-0.005, 0.03$	$0.116, 0.44$	40.271819	0.894326	34.112630	4.623346
$-0.005, 0.03$	$0.44, 0.616$	7.858009	0.613963	7.350912	1.218388
$-0.005, 0.03$	$0.616, 1.0$	6.566649	0.848413	5.702969	1.848043

Summary

If you have any questions, comments:
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