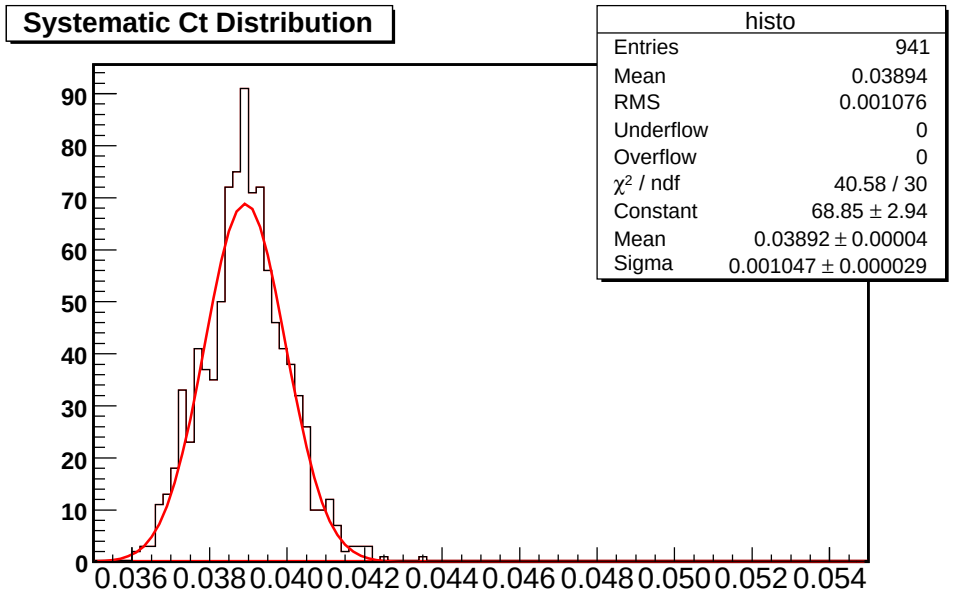
Fitter Bias Systematics

Fitter bias systematic: generate and fit with the same MultiShape configuration.

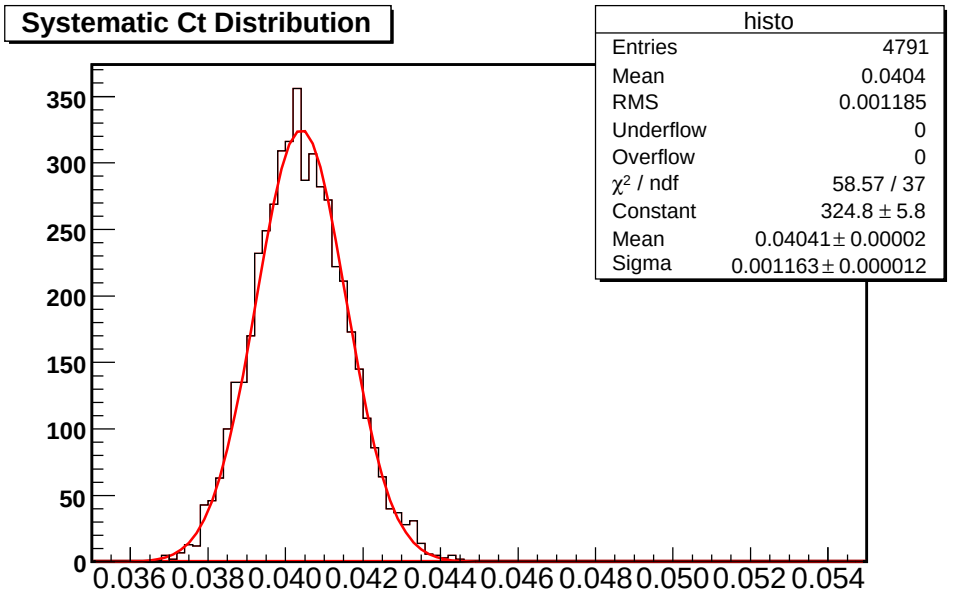
model	**N expt**	**N signal**	$ct(\Lambda_b^0)$ **in**	$ct(\Lambda_b^0)$ **out**	**diff**
MC 10-slice	100	$300,000$	368.6	$366.9 \pm 1.3 \mu m$	-1.7
Data 10-slice	$5,000$	$3,000$	409.1	$404.1 \pm 11.6 \mu m$	-5.0
Data 10-slice	$1,000$	$30,000$	409.1	$405.6 \pm 3.9 \mu m$	-3.5
Data Ave Eff	$1,000$	$3,000$	390.1	$389.2 \pm 10.5 \mu m$	-0.9

More bias in the 10-slice data fits.

$\sigma_{ct}(\Lambda_b^0)$

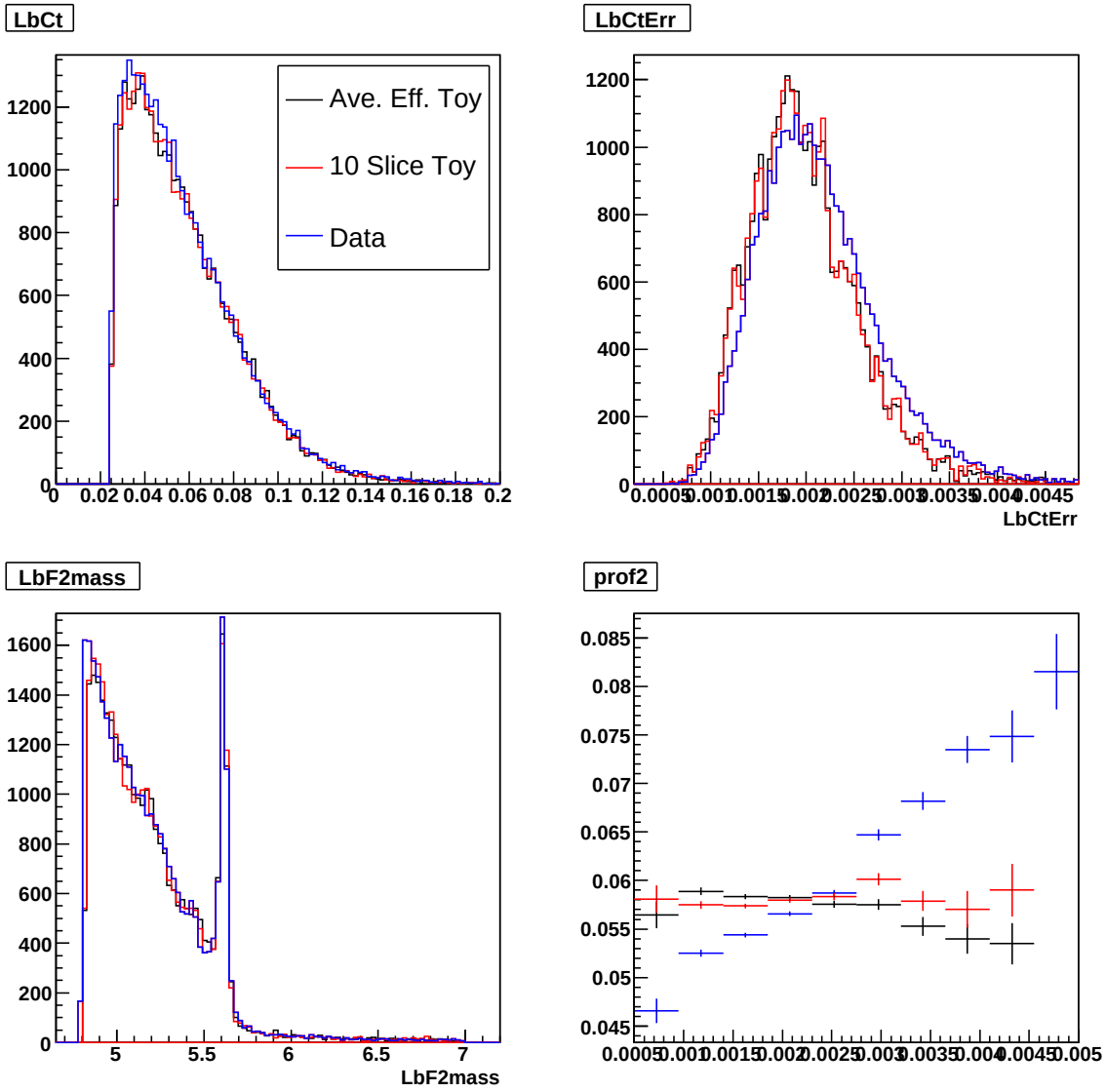


Syst. for Ave Eff. ($390.1\mu m$ as input)

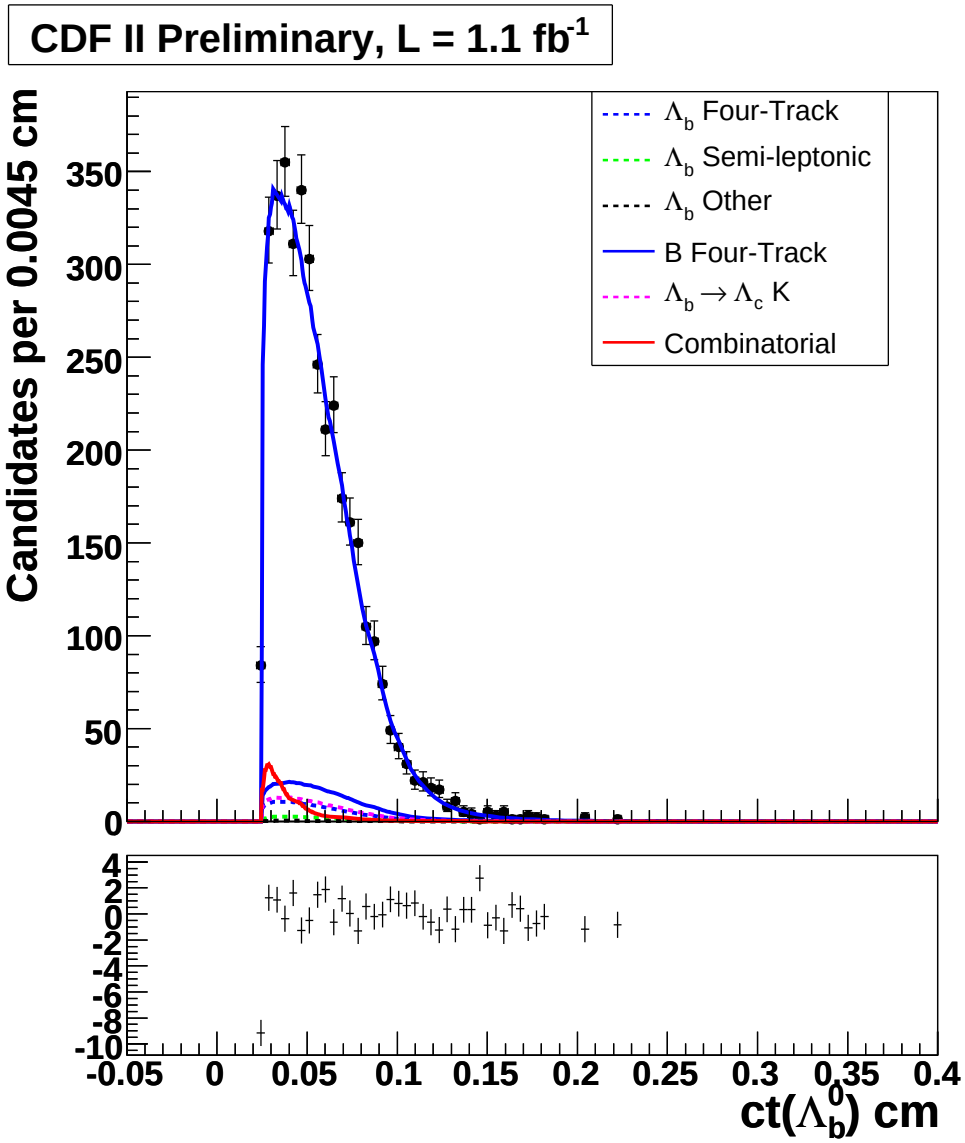


Syst. for 10-slice Eff. ($409.1\mu m$ as input)

Toy MC Comparison: Data, 3, and 10 slices

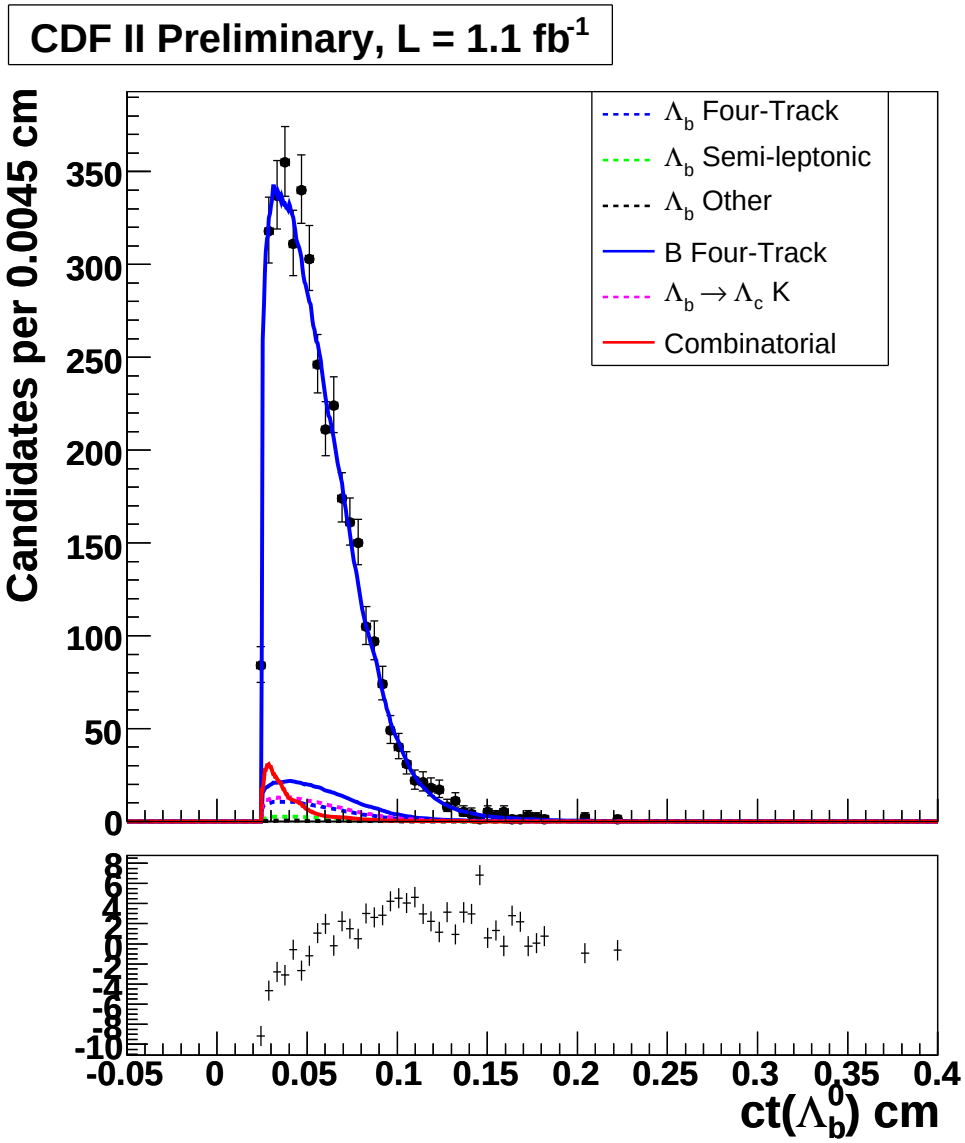


Blinded Data: Ave Eff Fit



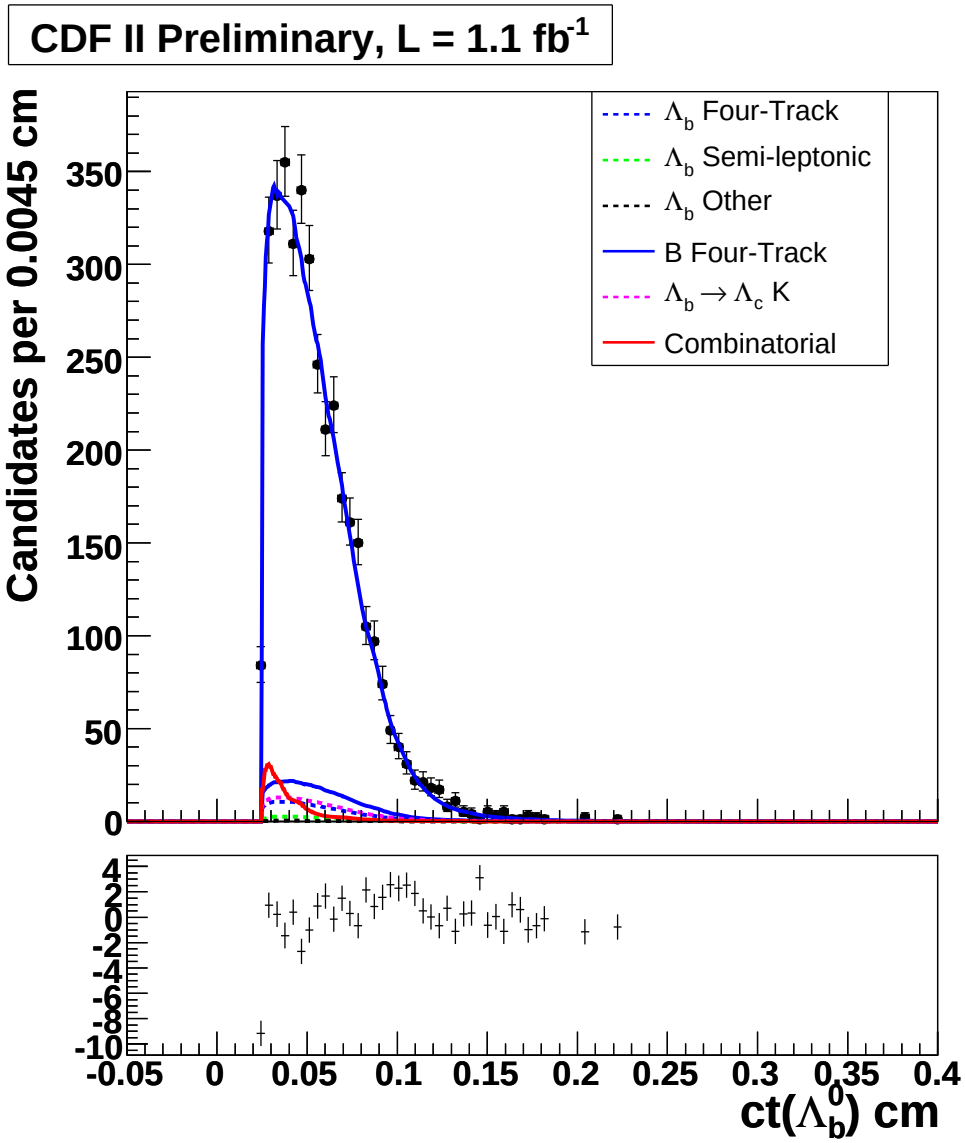
$$
\begin{aligned}
ct(\Lambda_b^0) &= 390.1 \pm 10.5 \mu m \\
p-value &= 0.47905 \\
\chi^2 &= 84.013937 \\
ndf &= 84 \\
\chi^2/ndf &= 1.000166
\end{aligned}
$$

Blinded Data: 3 slice Fit



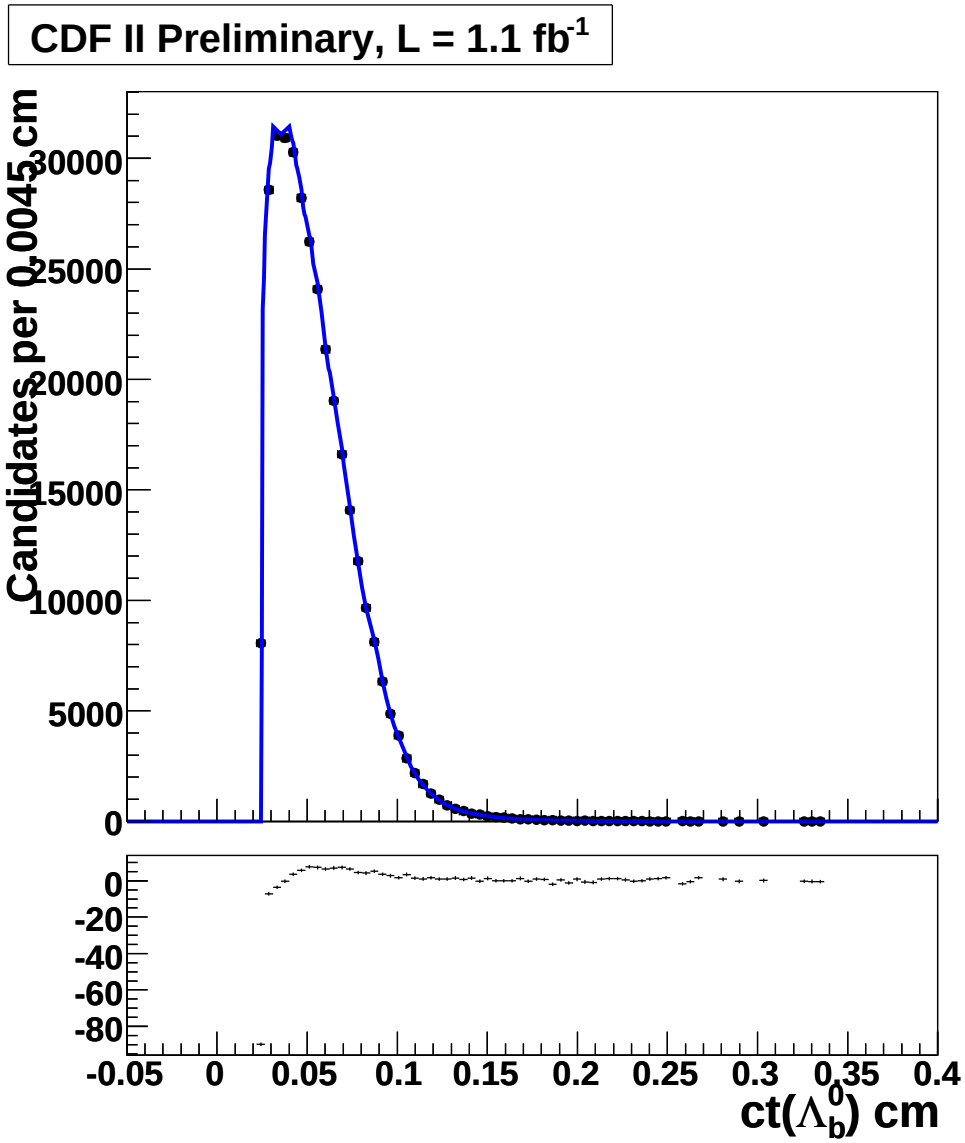
$$
\begin{aligned}
ct(\Lambda_b^0) &= 409.1 \pm 11.8 \mu m \\
p-value &= 0.478006 \\
\chi^2 &= 84.047951 \\
ndf &= 84 \\
\chi^2/ndf &= 1.000571
\end{aligned}
$$

Blinded Data: 10 slice Fit



$$
\begin{aligned}
ct(\Lambda_b^0) &= 409.4 \pm 11.9 \mu m \\
p-value &= 0.478922 \\
\chi^2 &= 84.018105 \\
ndf &= 84 \\
\chi^2/ndf &= 1.0002155
\end{aligned}
$$

Signal MC: Ave Eff Fit



$$
\begin{aligned}
ct(\Lambda_b^0) &= 368.6 \pm 1.0 \mu m \\
p-value &= 0.0 \\
\chi^2 &= 8064.0 \\
ndf &= 84 \\
\chi^2/ndf &= 96.0
\end{aligned}
$$

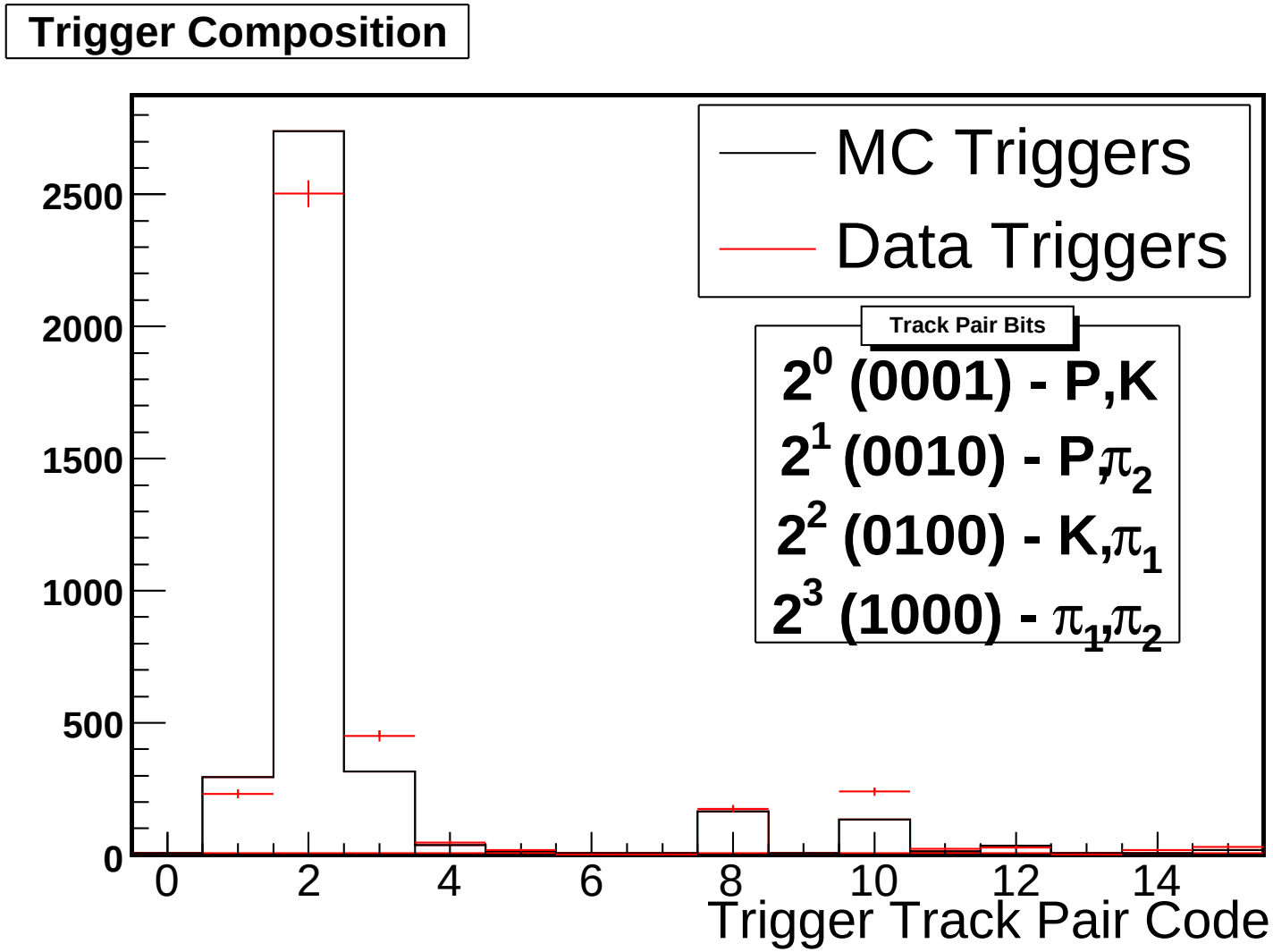
Signal MC: 10 Slice Fit

$$
\begin{aligned}
ct(\Lambda_b^0) &= 367.2 \pm 1.0 \mu m \\
p - value &= ?? \\
\chi^2 &= ??? \\
ndf &= ??? \\
\chi^2/ndf &= ???
\end{aligned}
$$

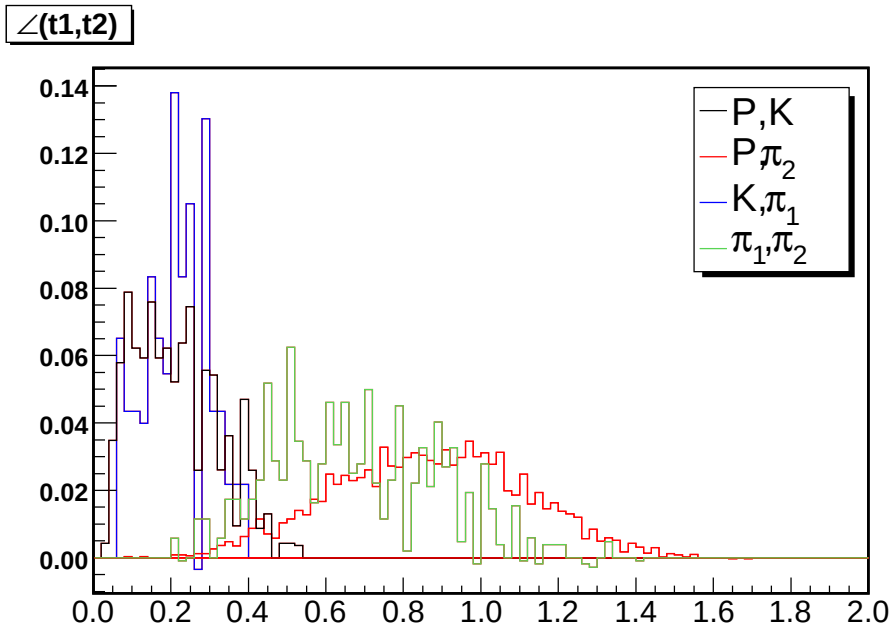
Fit Results Summary

Fit	$ct(\Lambda_b^0)$	**p-value**	χ^2	χ^2/ndf
Data Ave. Eff.	390.1 ± 10.5	.47905	84.013937	1.000166
Data 3 slices	409.1 ± 11.8	.47800	84.047951	1.000571
Data 10 slices	409.4 ± 11.9	.47892	84.018105	1.000215
MC Ave. Eff.	368.6 ± 1.0	0.0	8064.0	96.0
MC 10 slices	367.2 ± 1.0	0.0		

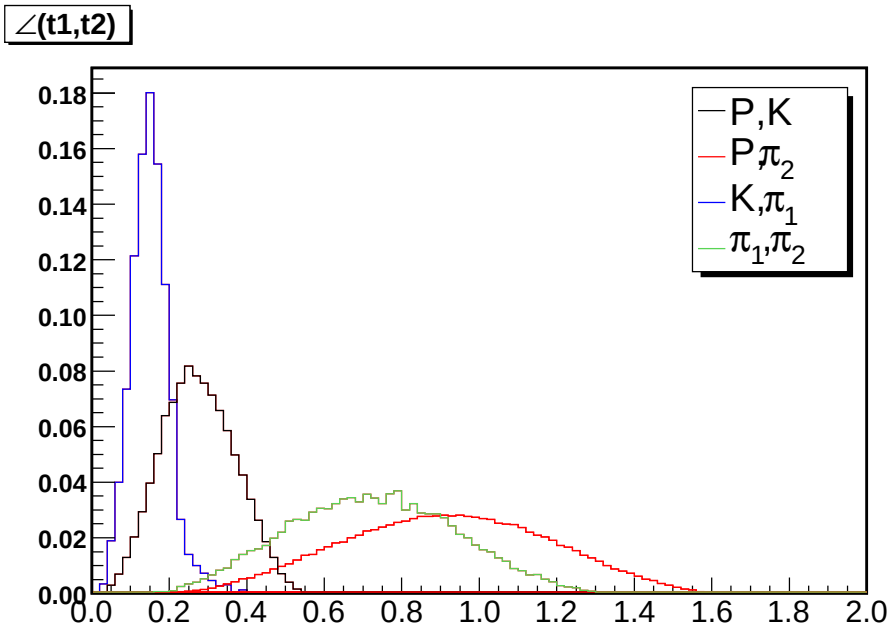
Trigger Composition



Angle Between Trigger Tracks

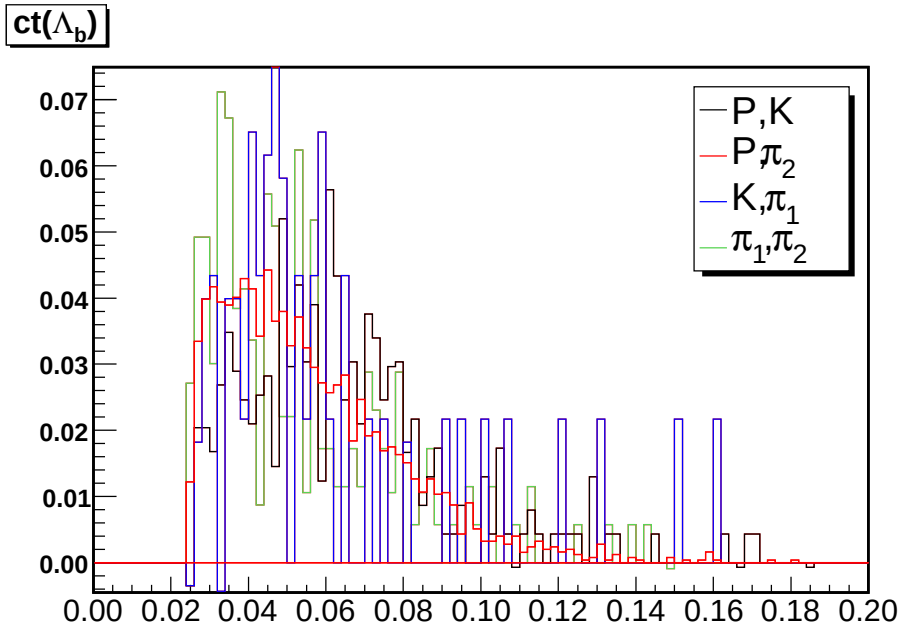


Side-Band Subtracted Data

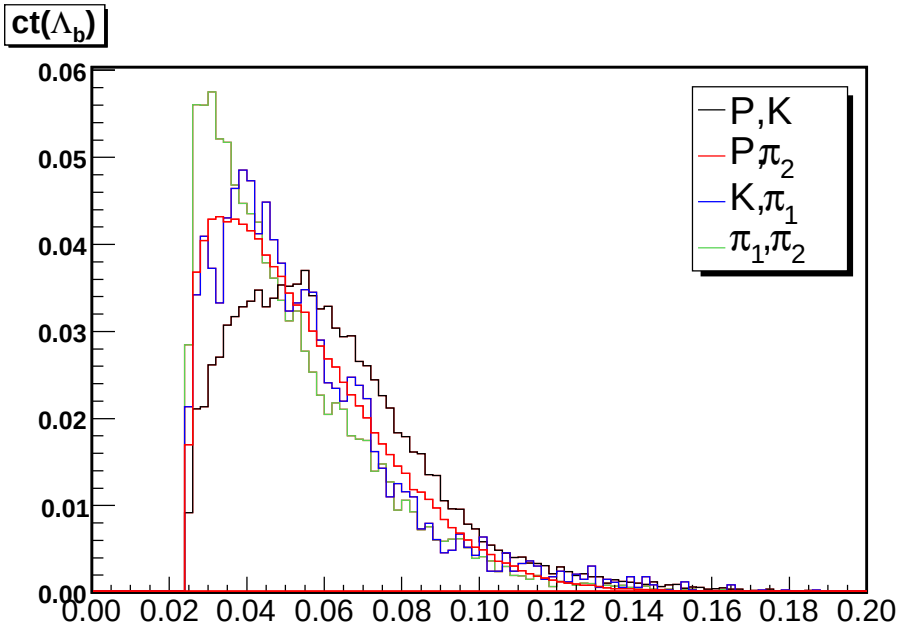


Monte Carlo

$ct(\Lambda_b^0)$

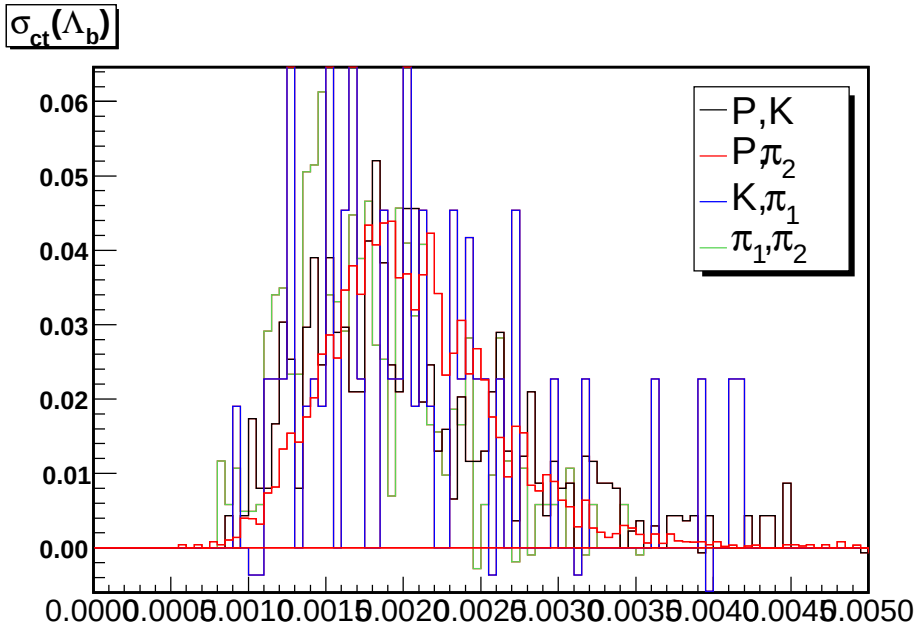


Side-Band Subtracted Data

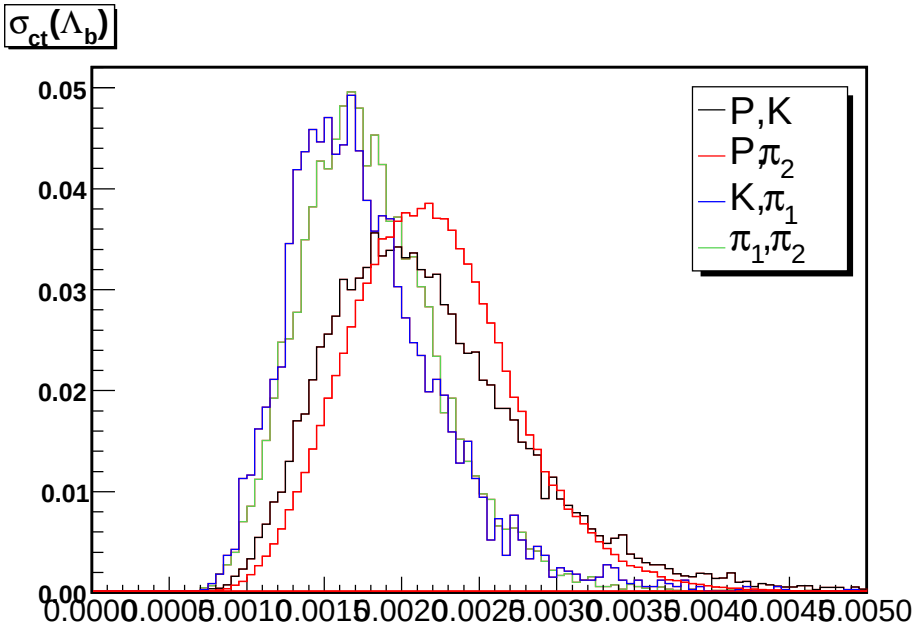


Monte Carlo

$\sigma_{ct}(\Lambda_b^0)$

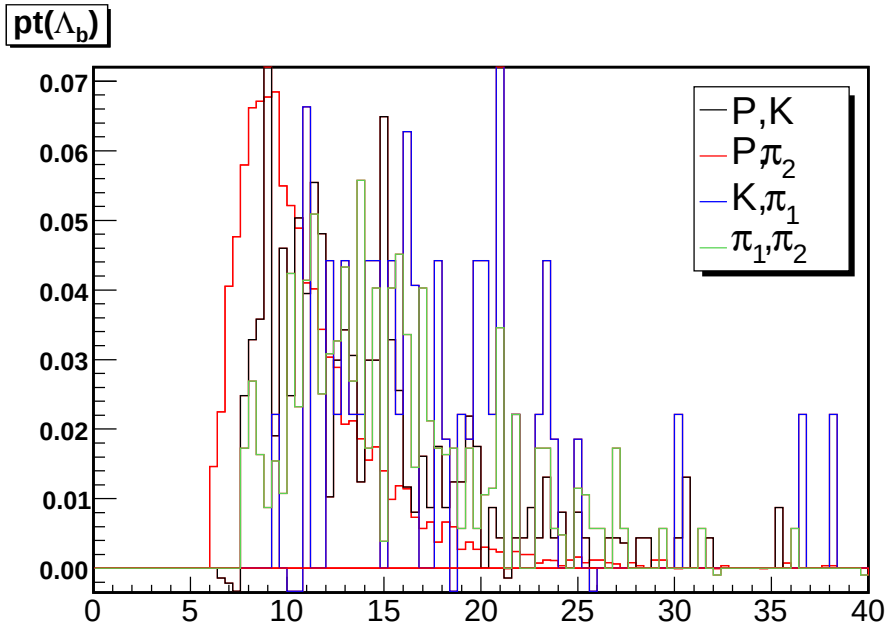


Side-Band Subtracted Data

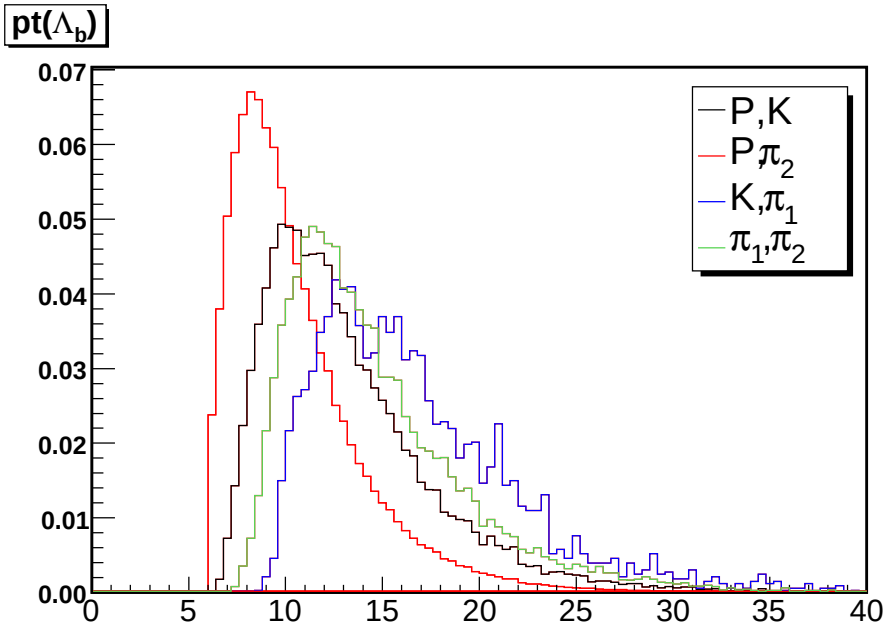


Monte Carlo

$p_T(\Lambda_b^0)$



Side-Band Subtracted Data



Monte Carlo