0.0.1 *Results: ΛK^0_S and $\Lambda K^{\pm}$: 3 Residual Correlations Included in Fit*

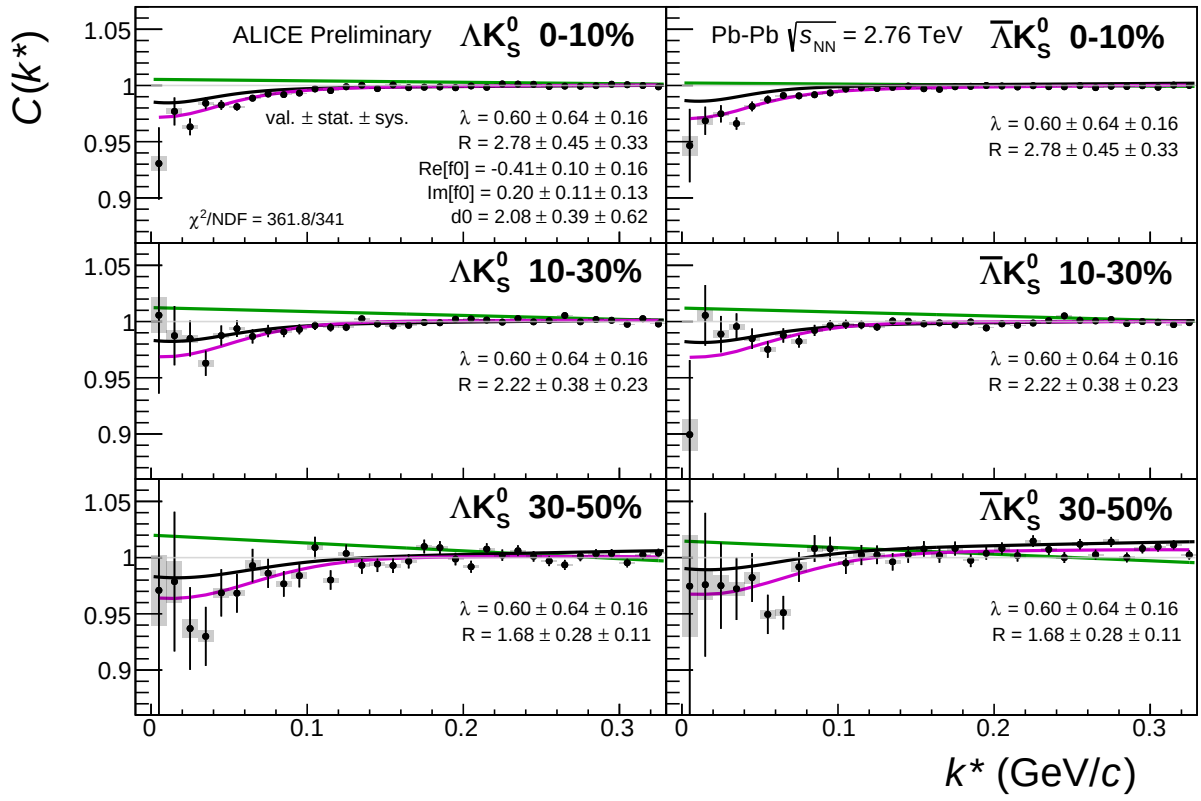

Fig. 1: Fits, with 3 residual correlations included, to the ΛK^0_S (left) and $\bar{\Lambda} K^0_S$ (right) data for the centralities 0-10% (top), 10-30% (middle), and 30-50% (bottom). The lines represent the statistical errors, while the boxes represent the systematic errors. Each has unique λ and normalization parameters. The radii are shared amongst like centralities; the scattering parameters ($\mathbb{R}f_0$, $\mathbb{I}f_0$, d_0) are shared amongst all. The black solid line represents the "raw" fit, i.e. not corrected for momentum resolution effects nor non-flat background. The green line shows the fit to the non-flat background. The purple points show the fit after momentum resolution and non-flat background corrections have been applied. The initial values of the parameters is listed, as well as the final fit values with uncertainties. Here, R was restricted to [2.,10.] and λ was restricted to [0.1,0.8].

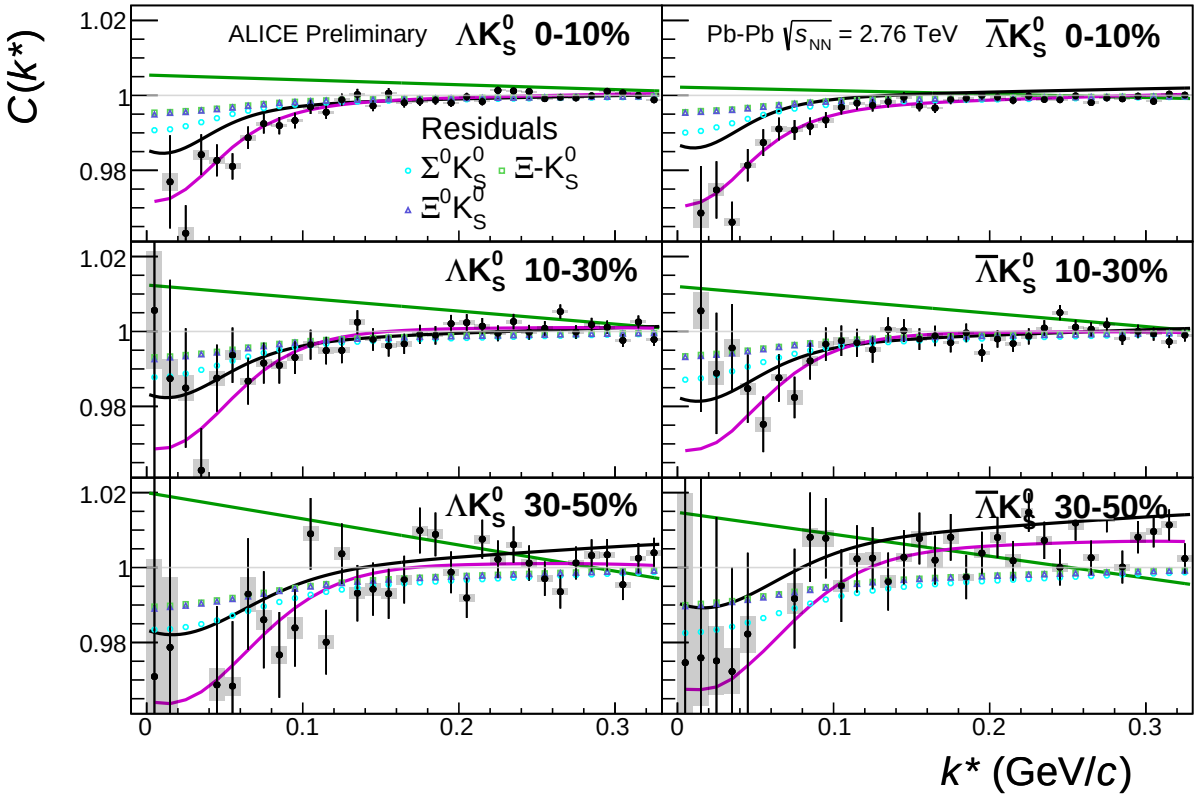

Fig. 2: Caption

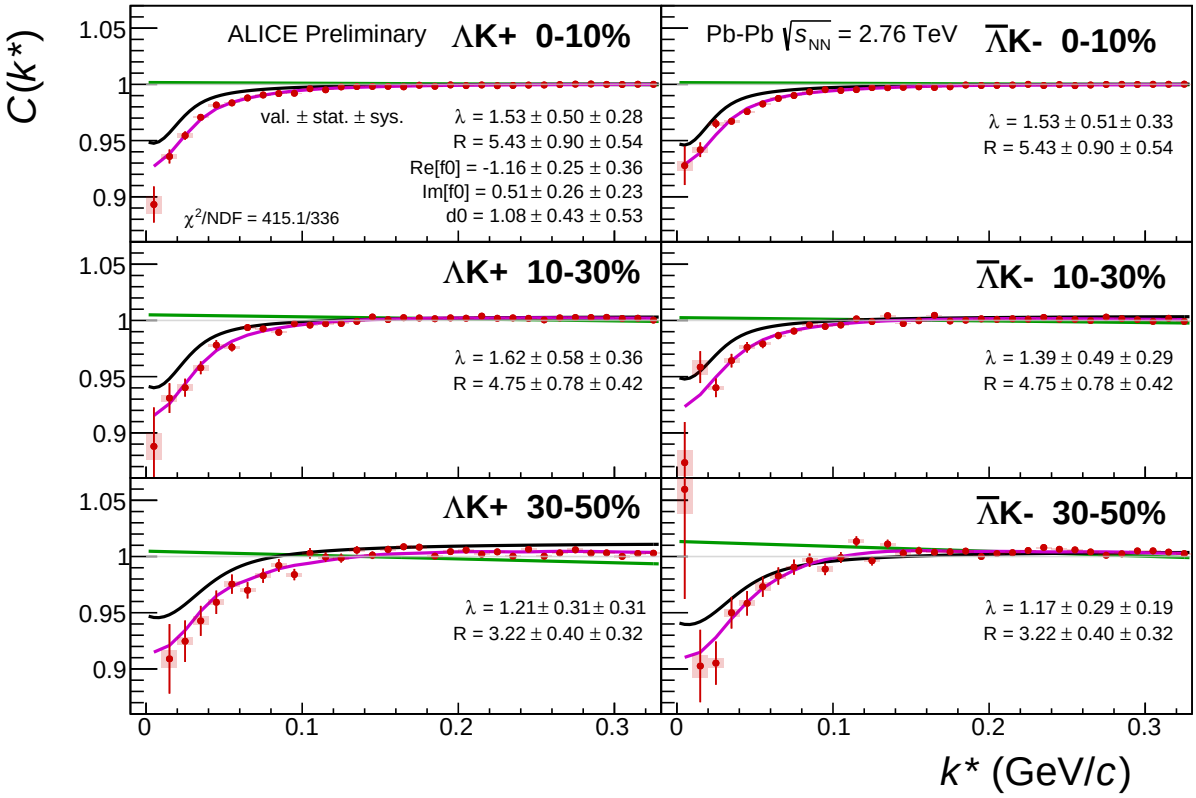

Fig. 3: Fits, with 3 residual correlations included, to the ΛK^+ (left) and $\bar{\Lambda} K^-$ (right) data for the centralities 0-10% (top), 10-30% (middle), and 30-50% (bottom). The lines represent the statistical errors, while the boxes represent the systematic errors. Each has unique λ and normalization parameters. The radii are shared amongst like centralities; the scattering parameters ($\mathbb{R}f_0$, $\mathbb{I}f_0$, d_0) are shared amongst all. The black solid line represents the "raw" fit, i.e. not corrected for momentum resolution effects nor non-flat background. The green line shows the fit to the non-flat background. The purple points show the fit after momentum resolution and non-flat background corrections have been applied. The initial values of the parameters is listed, as well as the final fit values with uncertainties.

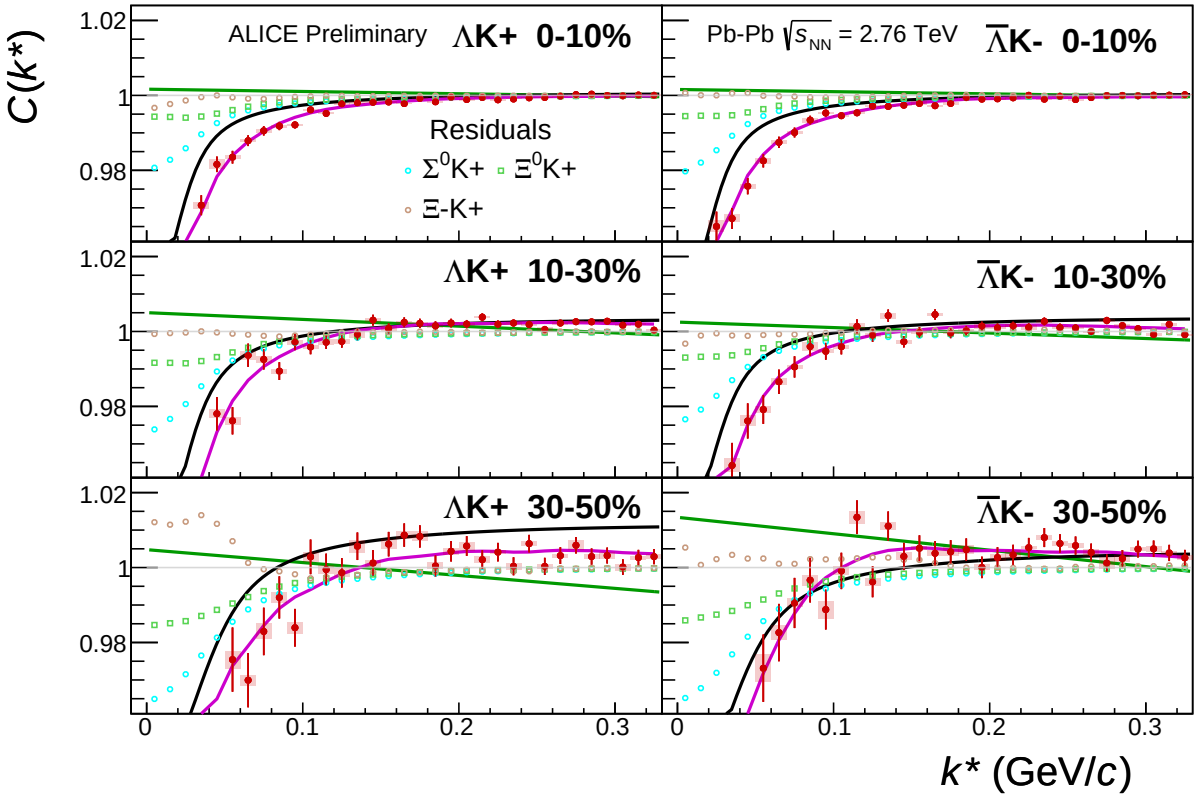

Fig. 4: Caption

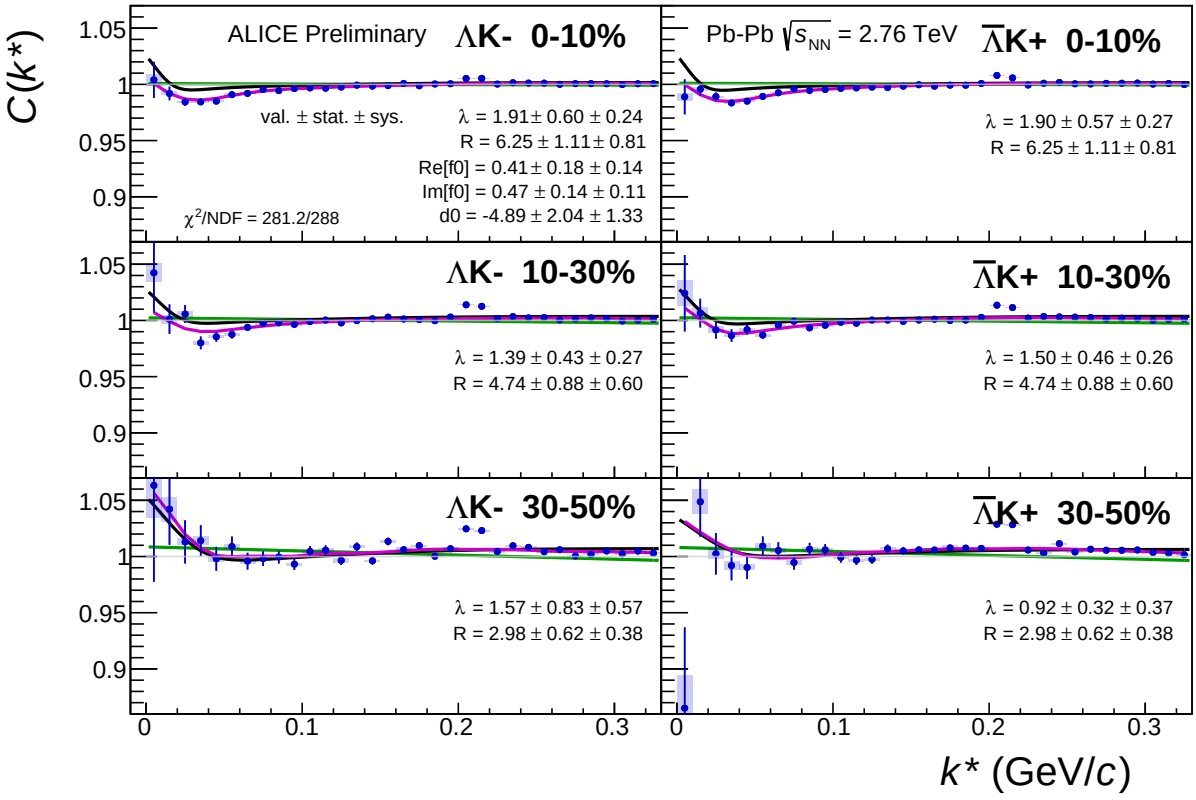

Fig. 5: Fits, with 3 residual correlations included, to the ΛK^- (left) with $\bar{\Lambda}K^+$ (right) data for the centralities 0-10% (top), 10-30% (middle), and 30-50% (bottom). The lines represent the statistical errors, while the boxes represent the systematic errors. Each has unique λ and normalization parameters. The radii are shared amongst like centralities; the scattering parameters ($\mathbb{R}f_0$, $\mathbb{I}f_0$, d_0) are shared amongst all. The black solid line represents the "raw" fit, i.e. not corrected for momentum resolution effects nor non-flat background. The green line shows the fit to the non-flat background. The purple points show the fit after momentum resolution and non-flat background corrections have been applied. The initial values of the parameters is listed, as well as the final fit values with uncertainties.

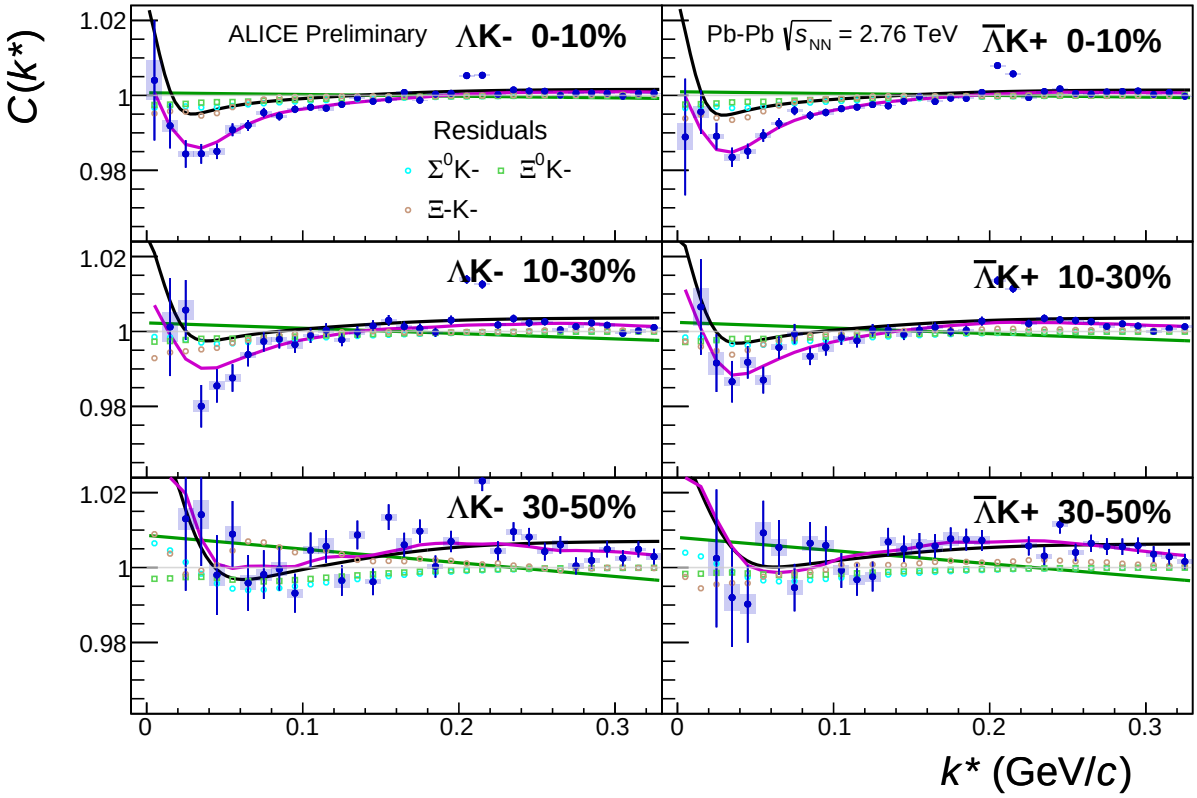

Fig. 6: Caption

Fit Results $\Lambda(\bar{\Lambda})K^0_S$

System	Centrality	Fit Parameters				
		λ	R	$\mathbb{R}f_0$	$\mathbb{I}f_0$	d_0
ΛK^0_S & $\bar{\Lambda}K^0_S$	0-10%	0.60 ± 0.63 (stat.) ± 0.16 (sys.)	2.78 ± 0.45 (stat.) ± 0.33 (sys.)	-0.41 ± 0.10 (stat.) ± 0.16 (sys.)	0.20 ± 0.10 (stat.) ± 0.13 (sys.)	2.08 ± 0.39 (stat.) ± 0.62 (sys.)
	10-30%		2.22 ± 0.37 (stat.) ± 0.23 (sys.)			
	30-50%		1.68 ± 0.28 (stat.) ± 0.11 (sys.)			

Table 1: Fit Results $\Lambda(\bar{\Lambda})K^0_S$, with 3 residual correlations included. Each pair is fit simultaneously with its conjugate (ie. ΛK^0_S with $\bar{\Lambda}K^0_S$) across all centralities (0-10%, 10-30%, 30-50%), for a total of 6 simultaneous analyses in the fit. Each analysis has a unique λ and normalization parameter. The radii are shared between analyses of like centrality, as these should have similar source sizes. The scattering parameters ($\mathbb{R}f_0$, $\mathbb{I}f_0$, d_0) are shared amongst all. The fit is done on the data with only statistical error bars. The errors marked as "stat." are those returned by MINUIT. The errors marked as "sys." are those which result from my systematic analysis (as outlined in Section **??**).

Fit Results $\Lambda(\bar{\Lambda})K^{\pm}$

System	Centrality	Pair Type	Fit Parameters				
			λ	R	$\mathbb{R}f_0$	$\mathbb{I}f_0$	d_0
ΛK^+ & $\bar{\Lambda}K^-$	0-10%	ΛK^+ $\bar{\Lambda}K^-$	1.53 ± 0.56 (stat.) ± 0.28 (sys.) 1.53 ± 0.57 (stat.) ± 0.33 (sys.)	5.43 ± 1.09 (stat.) ± 0.54 (sys.)	-1.16 ± 0.25 (stat.) ± 0.36 (sys.)	0.51 ± 0.28 (stat.) ± 0.23 (sys.)	1.08 ± 0.43 (stat.) ± 0.53 (sys.)
	10-30%	ΛK^+ $\bar{\Lambda}K^-$	1.62 ± 0.58 (stat.) ± 0.36 (sys.) 1.39 ± 0.49 (stat.) ± 0.29 (sys.)	4.75 ± 0.82 (stat.) ± 0.42 (sys.)			
	30-50%	ΛK^+ $\bar{\Lambda}K^-$	1.21 ± 0.31 (stat.) ± 0.31 (sys.) 1.17 ± 0.30 (stat.) ± 0.19 (sys.)	3.22 ± 0.41 (stat.) ± 0.32 (sys.)			
ΛK^- & $\bar{\Lambda}K^+$	0-10%	ΛK^- $\bar{\Lambda}K^+$	1.91 ± 0.60 (stat.) ± 0.24 (sys.) 1.90 ± 0.57 (stat.) ± 0.27 (sys.)	6.25 ± 1.08 (stat.) ± 0.81 (sys.)	0.41 ± 0.18 (stat.) ± 0.14 (sys.)	0.47 ± 0.15 (stat.) ± 0.11 (sys.)	-4.89 ± 2.16 (stat.) ± 1.33 (sys.)
	10-30%	ΛK^- $\bar{\Lambda}K^+$	1.39 ± 0.43 (stat.) ± 0.27 (sys.) 1.50 ± 0.46 (stat.) ± 0.26 (sys.)	4.74 ± 0.86 (stat.) ± 0.60 (sys.)			
	30-50%	ΛK^- $\bar{\Lambda}K^+$	1.57 ± 0.82 (stat.) ± 0.57 (sys.) 0.92 ± 0.31 (stat.) ± 0.37 (sys.)	2.98 ± 0.61 (stat.) ± 0.38 (sys.)			

Table 2: Fit Results $\Lambda(\bar{\Lambda})K^{\pm}$, with 3 residual correlations included. Each pair is fit simultaneously with its conjugate (ie. ΛK^+ with $\bar{\Lambda}K^-$ and ΛK^- with $\bar{\Lambda}K^+$) across all centralities (0-10%, 10-30%, 30-50%), for a total of 6 simultaneous analyses in the fit. Each analysis has a unique λ and normalization parameter. The radii are shared between analyses of like centrality, as these should have similar source sizes. The scattering parameters ($\mathbb{R}f_0$, $\mathbb{I}f_0$, d_0) are shared amongst all. The fit is done on the data with only statistical error bars. The errors marked as "stat." are those returned by MINUIT. The errors marked as "sys." are those which result from my systematic analysis (as outlined in Section **??**).

		Fit Parameters (value $\pm$ statistical error $\pm$ systematic error)		
Pair Type	**Centrality**	**R**		
ΛK^+ & $\bar{\Lambda} K^-$	**0-10%**	**$5.43 \pm 1.09 \pm 0.54$**		
	10-30%	**$4.75 \pm 0.82 \pm 0.42$**		
	30-50%	**$3.22 \pm 0.41 \pm 0.32$**		
		$\Re f_0$	**$\Im f_0$**	**d_0**
		$-1.16 \pm 0.25 \pm 0.36$	**$0.51 \pm 0.28 \pm 0.23$**	**$1.08 \pm 0.43 \pm 0.53$**
ΛK^- & $\bar{\Lambda} K^+$	**0-10%**	**$6.25 \pm 1.08 \pm 0.81$**		
	10-30%	**$4.74 \pm 0.86 \pm 0.60$**		
	30-50%	**$2.98 \pm 0.61 \pm 0.38$**		
		$\Re f_0$	**$\Im f_0$**	**d_0**
		$0.41 \pm 0.18 \pm 0.14$	**$0.47 \pm 0.15 \pm 0.11$**	**$-4.89 \pm 2.16 \pm 1.33$**
ΛK^0_S & $\bar{\Lambda} K^0_S$	**0-10%**	**$2.78 \pm 0.45 \pm 0.33$**		
	10-30%	**$2.22 \pm 0.37 \pm 0.23$**		
	30-50%	**$1.68 \pm 0.28 \pm 0.11$**		
		$\Re f_0$	**$\Im f_0$**	**d_0**
		$-0.41 \pm 0.10 \pm 0.16$	**$0.20 \pm 0.10 \pm 0.13$**	**$2.08 \pm 0.39 \pm 0.62$**

Table 3: Fit Results $\Lambda(\bar{\Lambda})K^{\pm}$ and $\Lambda(\bar{\Lambda})K^0_S$, with 3 residual correlations included (λ parameters not shown). This table is a condensed version of Tables 1 and 2

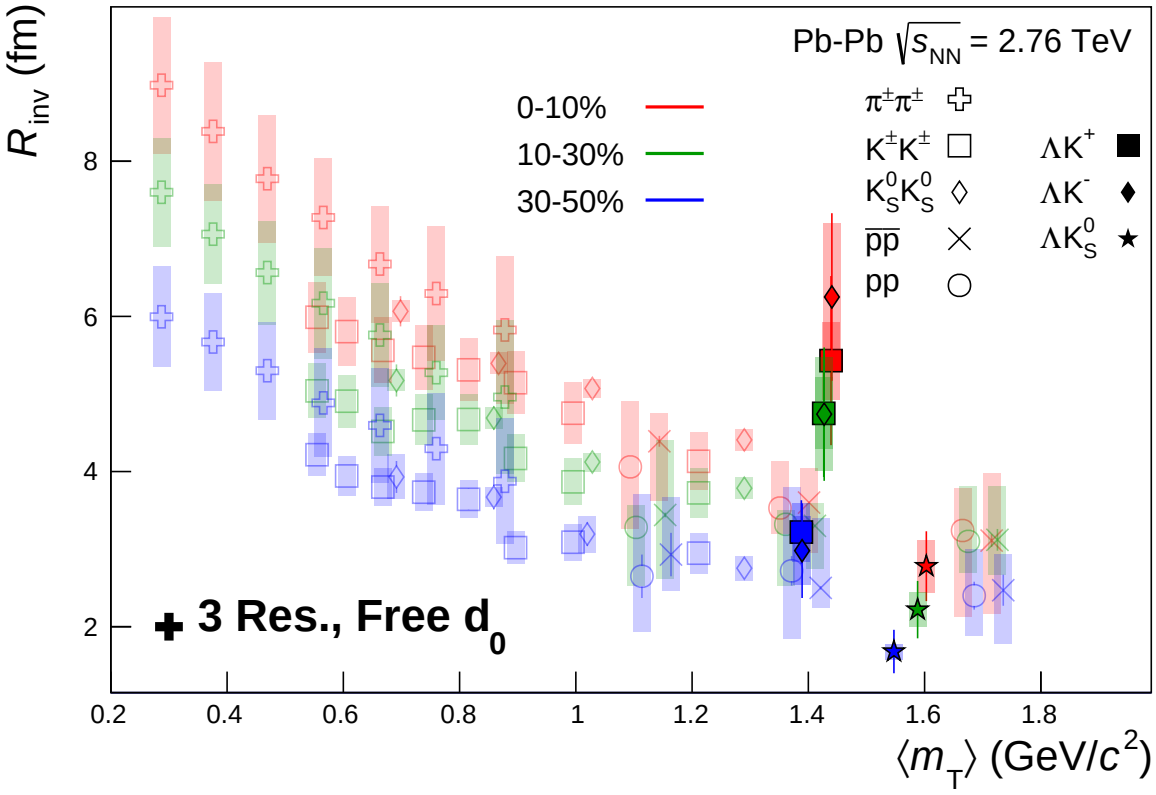

Fig. 7: 3 residual correlations in ΛK fits. Extracted fit R_{inv} parameters as a function of pair transverse mass (m_{T}) for various pair systems over several centralities. The ALICE published data [**?**] is shown with transparent, open symbols. The new ΛK results are shown with opaque, filled symbols. In the left, the ΛK^+ (with it's conjugate pair) results are shown separately from the ΛK^- (with it's conjugate pair) results. In the right, all $\Lambda K^{\pm}$ results are averaged.

Polynomial Bgds, THERM Bgds fit together

System	Parameter	Methods			
		Separate	Share R	Share λ_{Conj}	Share Single λ
ΛK^+ & $\bar{\Lambda} K^-$	$\lambda_{\Lambda K^+,0-10\%}$	1.70	2.18	2.16	1.92
	$\lambda_{\bar{\Lambda} K^-,0-10\%}$	1.72	2.21	2.16	1.92
	$\lambda_{\Lambda K^+,10-30\%}$	1.88	1.78	1.67	1.57
	$\lambda_{\bar{\Lambda} K^-,10-30\%}$	1.66	1.58	1.67	1.57
	$\lambda_{\Lambda K^+,30-50\%}$	1.44	1.30	1.18	1.20
	$\lambda_{\bar{\Lambda} K^-,30-50\%}$	1.33	1.21	1.18	1.20
	$R_{0-10\%}$	4.81	5.53	5.31	5.25
	$R_{10-30\%}$	4.38	4.37	4.22	4.26
	$R_{30-50\%}$	3.01	2.92	2.77	2.87
	$\mathbb{R}f_0$	-0.88	-0.87	-0.83	-0.89
	$\mathbb{I}f_0$	0.28	0.33	0.29	0.34
	d_0	1.32	1.27	1.28	1.29
ΛK^- & $\bar{\Lambda} K^+$	$\lambda_{\Lambda K^-,0-10\%}$	2.20	2.10	1.91	1.92
	$\lambda_{\bar{\Lambda} K^+,0-10\%}$	2.19	2.10	1.91	1.92
	$\lambda_{\Lambda K^-,10-30\%}$	1.58	1.62	1.53	1.57
	$\lambda_{\bar{\Lambda} K^+,10-30\%}$	1.67	1.71	1.53	1.57
	$\lambda_{\Lambda K^-,30-50\%}$	1.80	2.05	1.22	1.20
	$\lambda_{\bar{\Lambda} K^+,30-50\%}$	1.10	1.17	1.22	1.20
	$R_{0-10\%}$	5.61	5.53	5.31	5.25
	$R_{10-30\%}$	4.20	4.37	4.22	4.26
	$R_{30-50\%}$	2.70	2.92	2.77	2.87
	$\mathbb{R}f_0$	0.28	0.31	0.31	0.30
	$\mathbb{I}f_0$	0.35	0.37	0.40	0.39
	d_0	-5.75	-5.32	-4.81	-4.92

Table 4: Comparison: Polynomial non-flat background, THERMINATOR backgrounds fit togethe

Polynomial Bgds, THERM Bgds fit together

Centrality	System	Parameter	Methods			
			Separate	Share R	Share λ_{Conj}	Share Single λ
0-10%	ΛK^+	λ	1.70	2.18	2.16	1.92
	$\bar{\Lambda} K^-$	λ	1.72	2.21		
	ΛK^-	λ	2.20	2.10	1.91	
	$\bar{\Lambda} K^+$	λ	2.19	2.10		
	ΛK^+ & $\bar{\Lambda} K^-$	R	4.81	5.53	5.31	5.25
	ΛK^- & $\bar{\Lambda} K^+$	R	5.61			
10-30%	ΛK^+	λ	1.88	1.78	1.67	1.57
	$\bar{\Lambda} K^-$	λ	1.66	1.58		
	ΛK^-	λ	1.58	1.62	1.53	
	$\bar{\Lambda} K^+$	λ	1.67	1.71		
	ΛK^+ & $\bar{\Lambda} K^-$	R	4.38	4.37	4.22	4.26
	ΛK^- & $\bar{\Lambda} K^+$	R	4.20			
30-50%	ΛK^+	λ	1.44	1.30	1.18	1.20
	$\bar{\Lambda} K^-$	λ	1.33	1.21		
	ΛK^-	λ	1.80	2.05	1.22	
	$\bar{\Lambda} K^+$	λ	1.10	1.17		
	ΛK^+ & $\bar{\Lambda} K^-$	R	3.01	2.92	2.77	2.87
	ΛK^- & $\bar{\Lambda} K^+$	R	2.70			
	ΛK^+ & $\bar{\Lambda} K^-$	$\mathbb{R} f_0$	-0.88	-0.87	-0.83	-0.89
		$\mathbb{I} f_0$	0.28	0.33	0.29	0.34
		d_0	1.32	1.27	1.28	1.29
	ΛK^- & $\bar{\Lambda} K^+$	$\mathbb{R} f_0$	0.28	0.31	0.31	0.30
		$\mathbb{I} f_0$	0.35	0.37	0.40	0.39
		d_0	-5.75	-5.32	-4.81	-4.92

Table 5: Comparison: Polynomial non-flat background, THERMINATOR backgrounds fit together

Polynomial Bgds, THERM Bgds fit separate

Centrality	System	Parameter	Methods			
			Separate	Share R	Share λ_{Conj}	Share Single λ
0-10%	ΛK^+	λ	1.58	1.90	1.91	1.95
	$\bar{\Lambda} K^-$	λ	1.59	1.92		
	ΛK^-	λ	2.31	2.33	2.08	
	$\bar{\Lambda} K^+$	λ	2.29	2.31		
	ΛK^+ & $\bar{\Lambda} K^-$	R	4.93	5.37	5.12	4.97
	ΛK^- & $\bar{\Lambda} K^+$	R	5.20			
10-30%	ΛK^+	λ	1.70	1.59	1.52	1.57
	$\bar{\Lambda} K^-$	λ	1.50	1.41		
	ΛK^-	λ	1.67	1.77	1.65	
	$\bar{\Lambda} K^+$	λ	1.76	1.87		
	ΛK^+ & $\bar{\Lambda} K^-$	R	4.42	4.28	4.11	4.02
	ΛK^- & $\bar{\Lambda} K^+$	R	3.99			
30-50%	ΛK^+	λ	1.35	1.20	1.07	1.31
	$\bar{\Lambda} K^-$	λ	1.24	1.10		
	ΛK^-	λ	2.14	2.53	1.44	
	$\bar{\Lambda} K^+$	λ	1.29	1.41		
	ΛK^+ & $\bar{\Lambda} K^-$	R	3.10	2.93	2.73	2.83
	ΛK^- & $\bar{\Lambda} K^+$	R	2.64			
	ΛK^+ & $\bar{\Lambda} K^-$	$\mathbb{R} f_0$	-0.99	-0.96	-0.90	-0.83
		$\mathbb{I} f_0$	0.30	0.32	0.26	0.23
		d_0	1.14	1.09	1.10	1.08
	ΛK^- & $\bar{\Lambda} K^+$	$\mathbb{R} f_0$	0.23	0.27	0.27	0.28
		$\mathbb{I} f_0$	0.32	0.34	0.37	0.39
		d_0	-6.26	-5.79	-5.17	-4.87

Table 6: Comparison: Polynomial non-flat background, THERMINATOR backgrounds fit separately

Linear Bgds

Centrality	System	Parameter	Methods			
			Separate	Share R	Share λ_{Conj}	Share Single λ
0-10%	ΛK^+	λ	1.53	1.88	1.78	1.66
	$\bar{\Lambda} K^-$	λ	1.54	1.89		
	ΛK^-	λ	1.91	1.81	1.60	
	$\bar{\Lambda} K^+$	λ	1.90	1.81		
	ΛK^+ & $\bar{\Lambda} K^-$	R	5.43	6.10	5.76	5.81
	ΛK^- & $\bar{\Lambda} K^+$	R	6.26			
10-30%	ΛK^+	λ	1.62	1.61	1.44	1.34
	$\bar{\Lambda} K^-$	λ	1.39	1.39		
	ΛK^-	λ	1.39	1.40	1.30	
	$\bar{\Lambda} K^+$	λ	1.50	1.50		
	ΛK^+ & $\bar{\Lambda} K^-$	R	4.75	4.82	4.58	4.61
	ΛK^- & $\bar{\Lambda} K^+$	R	4.74			
30-50%	ΛK^+	λ	1.21	1.13	1.04	1.02
	$\bar{\Lambda} K^-$	λ	1.17	1.10		
	ΛK^-	λ	1.57	1.70	1.00	
	$\bar{\Lambda} K^+$	λ	0.92	0.96		
	ΛK^+ & $\bar{\Lambda} K^-$	R	3.22	3.15	2.98	3.06
	ΛK^- & $\bar{\Lambda} K^+$	R	2.98			
	ΛK^+ & $\bar{\Lambda} K^-$	$\mathbb{R} f_0$	-1.16	-1.13	-1.12	-1.19
		$\mathbb{I} f_0$	0.50	0.58	0.50	0.58
		d_0	1.08	1.04	1.00	1.11
	ΛK^- & $\bar{\Lambda} K^+$	$\mathbb{R} f_0$	0.41	0.44	0.44	0.43
		$\mathbb{I} f_0$	0.47	0.49	0.54	0.52
		d_0	-4.89	-4.49	-4.04	-4.21

Table 7: Comparison: Linear non-flat background