# <sup>231</sup> 1 Supplementary material for LHCb-PAPER-2018 <sup>232</sup> 051

### <sup>233</sup> 1.1 Further tables and plots for the nominal solution

The results of the nominal solution as function of  $x, y, \Delta x, \Delta y$  is shown in Table 2. Its corresponding correlation matrix is presented in Table 3.

Table 2: Dalitz plot fit results of the nominal solution as function of  $x, y, \Delta x, \Delta y$ , where the uncertainty presented is statistical only.

Component	x	y	$\Delta x$	$\Delta y$
$K^{*}(892)^{0}$	1.00  (fixed)	0 (fixed)	$-0.06 \pm 0.04$	0  (fixed)
$K_0^*(1430)^0$	$-0.66 \pm 0.08$	$0.26\pm0.09$	$-0.07 \pm 0.08$	$-0.31\pm0.08$
Single-Pole	$-1.77 \pm 0.16$	$-0.49 \pm 0.15$	$0.14 \pm 0.11$	$-0.97\pm0.16$
$ \rho(1450)^0 $	$-1.80 \pm 0.16$	$0.53 \pm 0.24$	$-0.33 \pm 0.14$	$-0.70\pm0.25$
$f_2(1270)$	$-0.46 \pm 0.13$	$-0.86 \pm 0.09$	$0.23 \pm 0.13$	$0.03\pm0.09$
rescattering	$0.60\pm0.19$	$-1.22 \pm 0.13$	$0.46\pm0.20$	$-0.37\pm0.12$
$\phi(1020)$	$0.03\pm0.07$	$0.03 \pm 0.05$	$0.09 \pm 0.07$	$-0.18 \pm 0.05$

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Projections of the nominal solution, separated by charge, are shown in Figs. 4, 5 and 6. The Dalitz plot of the  $B^+$  and  $B^-$  candidates is shown in Fig. 7.



Figure 4: Distribution of  $m_{\pi^{\pm}K^{\mp}}^2$  up to 3.5 GeV<sup>2</sup>/ $c^4$ . Data are represented by points for  $B^+$  and  $B^-$  candidates separately, with the result of the nominal solution overlaid. The relative contribution of the individual components in the model is also shown, with the interference terms effects not included.



Figure 5: Distribution of  $m_{\pi^{\pm}K^{\mp}}^2$  in the high mass region. Data are represented by points for (top)  $B^+$  and (bottom)  $B^-$  with the result of the nominal solution overlaid. The relative contribution of the individual components in the model is also shown, with the interference terms effects not included.



Figure 6: Distribution of  $m_{K^+K^-}^2$  up to 3.5 GeV<sup>2</sup>/ $c^4$ . Data are represented by points for  $B^+$  and  $B^-$  candidates separately, with the result of the nominal solution overlaid. The relative contribution of the individual components in the model is also shown, with the interference terms effects not included.



Figure 7: Dalitz plot for  $B^+ \to \pi^+ K^- K^+$  and  $B^- \to \pi^- K^+ K^-$  candidates in the selected signal region.

Table 3: Correlation matrix for the nominal solution.

 $K^{*0}(892)$ : par  $3 = \Delta x$ .  $K_0^*(1430)^0$ : par 5,6,7,8 =  $x, y, \Delta x, \Delta y$ . NR Single-Pole Form Factor: par 9,10,11,12 =  $x, y, \Delta x, \Delta y$ .  $\rho(1450)^0$ : par 13,14,15,16 =  $x, y, \Delta x, \Delta y$ .  $f_2(1270)$ : par 17,18,19,20 =  $x, y, \Delta x, \Delta y$ . Rescattering: par 21,22,23,24 =  $x, y, \Delta x, \Delta y$ .  $\phi(1020)$ : par 24,26,27,28 =  $x, y, \Delta x, \Delta y$ .

28	0.054	0.034	-0.070	-0.005	-0.037	0.184	-0.161	0.165	0.007	-0.000	-0.266	0.213	-0.078	0.262	-0.085	0.044	0.005	0.294	0.305	0.161	0.295	-0.217	0.115	0.267	1.0
.77	-0.008	-0.049	-0.018	0.015	-0.021	0.011	-0.229	0.136	0.090	-0.269	-0.304	0.331	0.043	0.300	-0.276	-0.141	0.218	0.298	0.116	-0.117	0.085	-0.417	-0.225	1.0	
26	0.036	-0.010	-0.034	-0.035	-0.030	0.092	-0.006	0.088	-0.153	0.183	-0.080	-0.109	-0.242	0.038	0.020	0.237	-0.170	0.169	0.235	0.306	0.254	0.275	1.0		
25	0.054	0.010	-0.031	-0.051	-0.033	0.113	0.087	0.055	-0.252	0.310	0.034	-0.311	-0.335	-0.138	0.213	0.328	-0.305	-0.106	0.094	0.318	0.158	1.0			
$^{24}$	0.163	0.002	-0.153	-0.088	-0.106	0.456	-0.238	0.401	-0.350	0.340	-0.532	-0.048	-0.693	0.408	-0.006	0.566	-0.416	0.673	0.833	0.830	1.0				
23	0.120	-0.045	-0.098	-0.124	-0.114	0.306	-0.024	0.306	-0.535	0.479	-0.218	-0.375	-0.834	0.069	0.204	0.777	-0.632	0.396	0.609	1.0					
22	0.195	0.107	-0.210	-0.072	-0.099	0.577	-0.365	0.469	-0.163	0.215	-0.708	0.244	-0.446	0.589	-0.132	0.350	-0.145	0.732	1.0						
21	0.064	-0.118	-0.098	-0.044	-0.090	0.190	-0.503	0.420	-0.047	-0.293	-0.794	0.488	-0.235	0.729	-0.566	0.095	0.179	1.0							
20	-0.088	-0.030	0.040	0.138	0.065	-0.203	-0.337	-0.033	0.519	-0.695	-0.301	0.689	0.686	0.449	-0.524	-0.659	1.0								
19.	0.112	0.000	-0.063	-0.086	-0.121	0.297	0.144	0.207	-0.612	0.619	0.0238	-0.604	-0.826	-0.171	0.461	1.0									
18	0.103	0.244	-0.054	-0.020	-0.006	0.275	0.425	-0.109	-0.301	0.737	0.520	-0.657	-0.322	-0.492	1.0										
17	0.100	0.020	0.164	0.012	0.053	0.301	-0.604	0.437	0.164	0.382	0.822	0.680	0.0416	1.0											
16.	-0.139	0.041	0.094 -	0.140	0.121	-0.324	-0.043 -	-0.284	0.634	-0.589 -	0.155 -	0.559	1.0												
15	-0.023	-0.024	-0.044	0.091	0.006	0.016	-0.512	0.192	0.459	-0.712	-0.646	1.0													
14	-0.116	0.039	0.161	0.026	0.090	-0.347	0.618	-0.497	-0.052	0.339	1.0														
13	0.180	0.238	-0.138	-0.073	-0.052	0.485	0.313	0.060	-0.421	1.0															
12.	-0.216	-0.246	0.089	0.207	0.521	-0.382	-0.164	-0.320	1.0																
11	0.359	-0.030	-0.591	-0.013	-0.194	0.572	-0.650	1.0																	
10	-0.129	0.159	0.533	-0.333	0.093	-0.293	1.0																		
6	0.339	0.257	-0.318	-0.067	-0.404	1.0																			
×	-0.113	-0.274	0.188	0.287	1.0																				
2	0.038	-0.407	-0.275	1.0																					
9	-0.217	0.163	1.0																						
5	0.068	1.0																							
	1.0																								

## <sup>238</sup> 1.2 Second fit solution

In the following the results and projections of the second solution are presented in Table 4and Figs. 8, 9, 10. This is interpreted as an unphysical solution.

Table 4: Results of the Dalitz plot fit using the isobar model for the second solution, where the uncertainty presented is statistical only. This solution is interpreted as unphysical.

	Fit frac	tion $(\%)$	Μ	agnitude and p	phase coefficient	S	$A_{CP}$ (%)
Component	$B^+$	$B^-$	$a_i^+$	$\delta_i^+[\circ]$	$a_i^-$	$\delta_i^-[\circ]$	
$K^{*}(892)^{0}$	$5.7 \pm 0.8$	$10.4\pm1.0$	$0.93\pm0.04$	0  (fixed)	$1.07\pm0.04$	0  (fixed)	$14.9 \pm 8.6$
$K_0^*(1430)^0$	$3.5 \pm 1.2$	$34.9\pm3.7$	$0.73\pm0.15$	$-176 \pm 10$	$1.97\pm0.14$	$-149 \pm 3$	$76.1 \pm 10.2$
Single-Pole	$30.9 \pm 1.9$	$31.0\pm3.0$	$2.16\pm0.13$	$-138 \pm 7$	$1.86\pm0.13$	$140 \pm 7$	$-15.0 \pm 5.9$
$\rho(1450)^0$	$29.5 \pm 1.8$	$32.4\pm2.1$	$2.11\pm0.11$	$-175\pm10$	$1.90\pm0.10$	$77 \pm 13$	$-10.6 \pm 4.4$
$f_2(1270)$	$4.7 \pm 0.9$	$10.8\pm1.4$	$0.84\pm0.09$	$-106\pm11$	$1.10\pm0.08$	$170\pm 5$	$25.7\pm10.3$
rescattering	$23.7 \pm 1.3$	$6.8\pm0.9$	$1.89\pm0.09$	$-57\pm12$	$0.87\pm0.07$	$-145\pm17$	$-65.0 \pm 3.9$
$\phi(1020)$	$0.2 \pm 0.2$	$0.4\pm0.2$	$0.19\pm0.07$	$-53\pm23$	$0.22\pm0.06$	$42 \pm 30$	$11.2\pm43.1$
Sum	98.3	126.7					



Figure 8: Distribution of  $m_{\pi^{\pm}K^{\mp}}^2$  up to 3.5 GeV<sup>2</sup>/ $c^4$ . Data are represented by points for  $B^+$  and  $B^-$  candidates separately, with the result of the second solution overlaid. This is interpreted as an unphysical solution. The relative contribution of the individual components in the model is also shown, with the interference terms effects not included.



Figure 9: Distribution of  $m_{\pi^{\pm}K^{\mp}}^2$  in the high mass region. Data are represented by points for (top)  $B^+$  and (bottom)  $B^-$  with the result of the second solution overlaid. This is interpreted as an unphysical solution. The relative contribution of the individual components in the model is also shown, with the interference terms effects not included.



Figure 10: Distribution of  $m_{K^+K^-}^2$  up to 3.5 GeV<sup>2</sup>/ $c^4$ . Data are represented by points for  $B^+$  and  $B^-$  candidates separately, with the result of the second solution overlaid. This is interpreted as an unphysical solution. The relative contribution of the individual components in the model is also shown, with the interference terms effects not included.

The results of the second solution given as function of  $x, y, \Delta x, \Delta y$  is shown in Table 5. Its corresponding correlation matrix is presented in Table. 6.

Table 5: Dalitz plot fit results of the second solution as function of  $x, y, \Delta x, \Delta y$ , where the uncertainty presented is statistical only.

Component	x	y	$\Delta x$	$\Delta y$
$K^*(892)^0$	1.00  (fixed)	0  (fixed)	$-0.08 \pm 0.04$	0  (fixed)
$K_0^*(1430)^0$	$-1.21\pm0.10$	$-0.53\pm0.12$	$0.48\pm0.08$	$0.48\pm0.13$
Single-Pole	$-1.51\pm0.16$	$-0.12 \pm 0.13$	$-0.09 \pm 0.13$	$-1.32\pm0.13$
$ \rho(1450)^0 $	$-0.83\pm0.21$	$0.84\pm0.20$	$-1.27 \pm 0.23$	$-1.01\pm0.19$
$f_2(1270)$	$-0.66\pm0.10$	$-0.31\pm0.13$	$0.42\pm0.09$	$-0.50\pm0.13$
rescattering	$0.16\pm0.18$	$-1.04\pm0.15$	$0.88\pm0.18$	$-0.54\pm0.15$
$\phi(1020)$	$0.14\pm0.06$	$-0.01\pm0.06$	$-0.02 \pm 0.06$	$-0.15\pm0.06$

Table 6: Correlation matrix for the second solution. This is interpreted as an unphysical solution.  $K^*(892)^0$ : par  $3 = \Delta x$ .  $K_0^*(1430)^0$ : par  $5,6,7,8 = x, y, \Delta x, \Delta y$ . NR Single-Pole Form Factor: par  $9,10,11,12 = x, y, \Delta x, \Delta y$ .  $\rho(1450)^0$ : par  $13,14,15,16 = x, y, \Delta x, \Delta y$ .  $f_2(1270)$ : par  $17,18,19,20 = x, y, \Delta x, \Delta y$ . Rescattering: par  $21,22,23,24 = x, y, \Delta x, \Delta y$ .  $\phi(1020)$ : par  $24,26,27,28 = x, y, \Delta x, \Delta y$ .

28	0.074	-0.043	0.094	-0.059	-0.147	0.24	-0.036	-0.021	-0.126	0.300	-0.283	-0.190	-0.073	0.254	0.226	0.095	-0.280	0.109	0.415	0.323	-0.015	0.389	-0.199	-0.341	1.0
27	0.016	0.108	-0.112	0.140	0.061	0.016	-0.181	0.233	-0.013	-0.221	-0.124	0.269	-0.295	0.110	-0.260	0.184	0.214	0.219	-0.039	0.028	0.313	-0.243	0.402	1.0	
26	0.002	0.108	0.124	0.146	0.083	0.021	0.159	0.221	0.017	-0.229	-0.085	0.292	-0.257	0.122	-0.306	0.226	0.231	0.339	-0.026	0.087	0.403	-0.354	1.0		
52	0.036	0.157	0.076 -	0.111	0.100	0.128 -	0.016 -	0.052	0.195	0.254 -	0.264 -	0.250	0.117 -	0.144	0.205 -	0.110	0.278	0.031	0.260 -	0.226	0.090	1.0			
4	0.092	0.257 -	0.221	0.339 -	0.074 -	0.182	0.474 -	0.559 -	0.055 -	0.407	0.530 -	0.597 -	0.704 -	0.484	0.610	0.630	0.394 -	0.898	0.288	0.408	1.0 -				
3	0.106	0.250	0.051 -	020.0	0.172	0.331	0.241	0.145	0.467 -	0.392 -	0.739 -	0.306	0.642 -	0.720	0.166 -	0.568	0.488	0.655	0.812	1.0					
2 2	0.197	- 800.0	).133	1.013 -	1.292 -	0.602	1.234 -1	0.133	.309 -	0.560	- 181.	0.301 -	- 7447	0.653	0.346	0.385	0.524 -	0.476	1.0						
1 2	0.094 (	0.073 (	0.181 (	).226 (	.019 -(	0.208 (	.452 -(	.513 (	.242 -(	).256 (	.638 -(	.405 -(	- 108.0	.561 (	).462 (	0.750 (	).175 -(	0.1							
2	.050 0	.424 0	.324 -0	.354 (	.318 (	.276 (	.221 -(	(397 (	.365 -(	.823 -(	.295 -(	.840 (	)- 2001	.158 (	.776 -(	.074 (	0.								
9. 20	.065 -0	.034 0	(130 -0	0 260.0	007 0	.167 -0	.409 -0	.428 0	.331 0	.174 -0	.602 0	.224 0	.744 -0	.098 -0	.251 -0	0.0	-								
1	.062 0	.227 -0	.361 -0	.353 0	.334 -0	.316 0	.289 -0	.464 0	.184 -0	.832 -0	.095 -0	.812 0	.368 -0	.573 0	0-0.	1									
18	212 0	.137 -0	.003 0	.114 -0	.208 -0	.584 0	.401 0	.352 -0	.297 -0	.287 0	.773 -0	.036 -0	.580 0	0 0.	1										
. 17	060 0.	060 0.	160 -0.	165 0.	0- 800	186 0.	462 -0.	476 0.	372 -0.	204 0	754 -0.	264 -0.	0	-i											
16	010 -0.	464 0.	325 0.	428 -0.	258 -0.	138 -0.	333 0.	532 -0.	301 0.	863 0.	101 0.	0.0	Τ.												
15	212 -0.0	0.23 0.4	016 -0.3	109 0.4	227 0.1	580 -0.	123 -0.3	352 0.1	383 0.3	330 -0.3	.0	÷													
14	23 -0.2	14 -0.0	33 -0.(	95 -0.1	67 0.2	63 -0.5	67 0.4	64 -0.3	58 0.3	9. 9	1.(														
13	17 0.1	75 -0.2	64 0.3	74 -0.2	75 -0.3	36 0.4	02 0.1	04 -0.3	-0.2	1.0															
12.	38 -0.2	11 0.4	1.0- 20	23 0.5	44 0.5	36 -0.4	99 0.1	-0.1	1.0																
11	2 0.2	40 0.4	15 -0.60	27 0.52	0 0.1	0.28	-0.79	1.0																	
10	8 -0.17	3 -0.52	5 0.6	9 -0.45	1 -0.05	-0.3(	1.0																		
6	6 0.33	6 0.07	4 0.20	9 -0.06	-0.63	1.0																			
×	5 -0.21	5 0.32	7 -0.46	0.46	1.0																				
2	5 -0.03	7 0.51	-0.53	1.0																					
9	7 0.00	-0.43'	1.0																						
5	0.057	1.0																							
3	1.0																								
	က	ŋ	9	1-	x	6	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28

## 243 **1.3** Systematic uncertainties

The systematic uncertainties for CP asymmetries, total fit fractions,  $B^+$  and  $B^-$  fit fractions, magnitudes and phases for the  $B^{\pm} \to \pi^{\pm} K^+ K^-$  Dalitz plot fit are shown in Tables 7 to 11, respectively.

 $A_{CP}$  $K^{*}(892)$  $K_0^*(1430)^0$ Single pole  $\rho(1450)^0$  $f_2(1270)$ Rescattering  $\phi(1020)$ Statistical uncertainty 5.310.23.8 43.6 8.7 14.94.4 $B^{\pm}$  mass fit Maximum value 2.62.632.01 0.28 0.08 0.26 10.11 Minimum value 0.26 0.350.250.730.1414.270.3Efficiency model Simulation sample size 0.540.9 0.270.370.830.392.47PID 1.750.41 0.120.03 0.07 0.010.06 L0 trigger correction 0.550.18 0.16 0.01 0.21 0.02 0.03 0.020.23 0.2Finer binning 0.96 0.110.151.01Coarse binning 0.190.17 2.050.072.211.4 0.21 $B^+$  production and detection asymmetry 1.491.511.481.481.390.851.47MC truth requirement 0.03 0.01 0.00.0 0.020.00.01 Background models Combinatorial background 1.341.190.420.190.850.372.52Peaking background 0.190.240.090.890.08 0.150.09 Isobar Model Fit bias 0.630.94 0.220.160.840.190.23Blatt Weisskopf radii set in 3  ${\rm GeV^{-1}}$ 0.830.362.791.04 2.780.91.39Blatt Weisskopf radii set in 5  $\text{GeV}^{-1}$ 0.41 0.39 0.33 3.39 0.431.240.8Mass and width variation 0.827.520.341.070.657.521.6 $\phi$  background level 0.10.06 0.060.07 0.420.07 9.14 Upward Downward 0.120.120.10.120.420.119.66  $\rho(1450)$  free to float in the fit 11.34 1.671.971.33 1.631.580.64 Total systematic uncertainty 4.518.78 3.452.364.811.9426.59

Table 7: Systematic uncertainties for the *CP* asymmetries (in percent).

#### Table 8: Systematic uncertainties for the total fit fractions (in percent).

Total fit fraction FF	$K^{*}(892)$	$K_0^*(1430)^0$	Single pole	$\rho(1450)^{0}$	$f_2(1270)$	Rescattering	$\phi(1020)$
Statistical uncertainty	0.60	0.68	1.54	1.22	0.82	0.75	0.13
$B^{\pm}$ mass fit							
Maximum value	0.38	0.78	2.0	0.25	0.06	0.55	0.01
Minimum value	0.04	0.19	0.51	0.08	0.07	0.44	0.05
Efficiency model							
Statistical fluctuation	0.04	0.04	0.09	0.09	0.07	0.09	0.01
PID	0.1	0.02	0.04	0.04	0.01	0.02	0.0
L0 trigger correction	0.03	0.01	0.05	0.03	0.01	0.04	0.0
Finer binning	0.01	0.02	0.05	0.11	0.05	0.13	0.01
Coarse binning	0.03	0.01	0.09	0.09	0.01	0.05	0.0
<i>B</i> production and detection asymmetry	0.03	0.02	0.02	0.02	0.05	0.13	0.0
MC truth requirement	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background models							
Combinatorial background	0.11	0.23	0.48	0.31	0.17	0.17	0.0
Peaking background	0.02	0.03	0.1	0.11	0.04	0.05	0.0
Isobar model							
Fit bias	0.22	0.05	0.19	0.04	0.0	0.02	0.05
Blatt Weisskopf radii set in 3 $\text{GeV}^{-1}$	0.03	0.38	0.13	0.02	0.12	0.29	0.01
Blatt Weisskopf radii set in 5 $\text{GeV}^{-1}$	0.01	0.21	0.14	0.1	0.04	0.21	0.0
Mass and Width variation	0.19	0.76	3.45	0.79	0.23	0.35	0.01
$\phi$ background level							
Upward	0.01	0.06	0.23	0.08	0.05	0.24	0.03
Downward	0.01	0.06	0.25	0.09	0.05	0.27	0.03
$\rho(1450)$ free to float in the fit	0.07	0.22	0.17	0.03	0.6	0.0	0.03
Total systematic uncertainty	0.51	1.23	4.07	0.92	0.69	0.97	0.09

$B^+$ Fit fraction: FF <sup>+</sup>	$K^{*}(892)$	$K_0^*(1430)^0$	Single pole	$\rho(1450)^0$	$f_2(1270)$	Rescattering	$\phi(1020)$
Statistical uncertainty	0.8	0.8	2.0	1.5	0.9	1.1	0.2
$B^{\pm}$ mass fit							
Maximum value	0.1	0.5	1.52	0.02	0.0	0.68	0.02
Minimum value	0.0	0.13	0.46	0.19	0.1	0.57	0.01
Efficiency model							
Simulation sample size	0.05	0.05	0.13	0.12	0.08	0.14	0.01
PID	0.18	0.03	0.07	0.06	0.02	0.06	0.0
L0 trigger correction	0.06	0.0	0.07	0.05	0.01	0.08	0.0
Finer binning	0.05	0.01	0.01	0.09	0.03	0.17	0.01
Coarse binning	0.02	0.06	0.0	0.15	0.14	0.04	0.01
B production and detection asymmetry	0.0	0.0	0.0	0.0	0.0	0.0	0.0
MC truth requirement	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background models							
Combinatorial background	0.16	0.17	0.43	0.31	0.16	0.19	0.01
Peaking background	0.02	0.02	0.08	0.1	0.03	0.06	0.0
Isobar Model							
Fit bias	0.13	0.07	0.13	0.01	0.06	0.07	0.05
Blatt Weisskopf radii set in 3 $\text{GeV}^{-1}$	0.03	0.24	0.13	0.14	0.25	0.29	0.02
Blatt Weisskopf radii set in 5 $GeV^{-1}$	0.02	0.15	0.0	0.0	0.05	0.2	0.01
Mass and width variation	0.11	0.8	3.0	0.79	0.22	0.42	0.02
$\phi$ background level							
Upward	0.0	0.04	0.22	0.12	0.06	0.32	0.0
Downward	0.01	0.04	0.24	0.14	0.07	0.35	0.0
$\rho(1450)$ free to float in the fit	0.16	0.09	0.56	0.38	0.49	0.11	0.06
Total systematic uncertainty	0.36	1.01	3.49	1.00	0.65	1.19	0.08
$B^-$ Fit fraction: FF <sup>-</sup>	$K^{*}(892)$	$K_0^*(1430)^0$	Single pole	$\rho(1450)^{0}$	$f_2(1270)$	Rescattering	$\phi(1020)$
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty	K*(892) 1.0	$K_0^*(1430)^0$ 1.2	Single pole 2.6	$\rho(1450)^0$ <b>1.9</b>	$f_2(1270)$ 1.3	Rescattering 0.8	$\phi(1020)$ <b>0.2</b>
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty       B <sup>±</sup> mass fit	K*(892) 1.0	$\frac{K_0^*(1430)^0}{1.2}$	Single pole 2.6	$\rho(1450)^0$ <b>1.9</b>	$f_2(1270)$ 1.3	Rescattering 0.8	φ(1020) <b>0.2</b>
$B^-$ Fit fraction: FF <sup>-</sup> Statistical uncertainty $B^{\pm}$ mass fit         Maximum value	K*(892)           1.0           0.8	$\frac{K_0^*(1430)^0}{1.2}$ 1.17	Single pole 2.6 2.61	$\rho(1450)^0$ <b>1.9</b> 0.63	$f_2(1270)$ 1.3 0.19	Rescattering 0.8 0.22	φ(1020) 0.2 0.04
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value	K*(892)           1.0           0.8           0.1	$\frac{K_0^*(1430)^0}{1.2}$ 1.17 0.28	Single pole <b>2.6</b> 0.57	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ 0.19\\ 0.01 \end{array}$	Rescattering 0.8 0.22 0.22	$\phi(1020)$ 0.2 0.04 0.13
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model	K*(892)           1.0           0.8           0.1	$\frac{K_0^*(1430)^0}{1.2}$ 1.17 0.28	Single pole <b>2.6</b> 2.61 0.57	$\frac{\rho(1450)^0}{1.9}$ 0.63 0.09	$\begin{array}{c} f_2(1270) \\ \hline 1.3 \\ 0.19 \\ 0.01 \end{array}$	Rescattering 0.8 0.22 0.22	$\begin{array}{c} \phi(1020) \\ \hline 0.2 \\ \hline 0.04 \\ 0.13 \end{array}$
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size	K*(892)           1.0           0.8           0.1           0.07	$\frac{K_0^*(1430)^0}{1.2}$ 1.17 0.28 0.05	Single pole <b>2.6</b> 2.61 0.57 0.13	$\begin{array}{c} \rho(1450)^0\\ \hline 1.9\\ 0.63\\ 0.09\\ 0.13 \end{array}$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\\hline 0.19\\0.01\\\hline 0.1\end{array}$	Rescattering 0.8 0.22 0.22 0.07	$\begin{array}{c} \phi(1020) \\ \hline 0.2 \\ \hline 0.04 \\ 0.13 \\ 0.01 \end{array}$
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID	K*(892)           1.0           0.8           0.1           0.07           0.01	$\frac{K_0^*(1430)^0}{1.2}$ 1.17 0.28 0.05 0.01	Single pole <b>2.6</b> 2.61 0.57 0.13 0.02	$\begin{array}{c} \rho(1450)^0\\ \hline 1.9\\ 0.63\\ 0.09\\ 0.13\\ 0.01 \end{array}$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\0.19\\0.01\\0.1\\0.0\end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0	$\begin{array}{c} \phi(1020)\\ \hline 0.2\\ \hline 0.04\\ 0.13\\ \hline 0.01\\ 0.0\\ \end{array}$
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.01 \end{array}$	Single pole <b>2.6</b> 2.61 0.57 0.13 0.02 0.02	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \\ 0.13 \\ 0.01 \\ 0.0 \end{array}$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\0.19\\0.01\\0.1\\0.0\\0.02\\\end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01	
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.09	$\begin{array}{r} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.13	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \end{array}$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\\hline 0.19\\0.01\\\hline 0.1\\0.0\\0.02\\0.15\\\hline \end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09	
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.09           0.04	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \end{array}$	Single pole <b>2.6</b> 2.61 0.57 0.13 0.02 0.02 0.13 0.22	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \\ 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \end{array}$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\\hline 0.19\\0.01\\\hline 0.1\\0.0\\0.02\\0.15\\0.14\\\hline \end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04	
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.02           0.03           0.04           0.0	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.13 0.22 0.0	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \\ 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \end{array}$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\0.19\\0.01\\0.0\\0.02\\0.15\\0.14\\0.0\\\end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0	$\begin{array}{c} \phi(1020)\\ \hline 0.2\\ \hline 0.04\\ 0.13\\ \hline 0.01\\ 0.0\\ 0.0\\ 0.02\\ 0.01\\ 0.0\\ \hline 0.0\\ 0.0\\ \end{array}$
B <sup>-</sup> Fit fraction: FF <sup>-</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.02           0.03           0.04           0.0	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.13 0.22 0.0 0.0 0.0	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \\ 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ 0.19\\ 0.01\\ 0.1\\ 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ \end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.0 0.0 0.0	$\begin{array}{c} \phi(1020)\\ \hline 0.2\\ \hline 0.04\\ 0.13\\ \hline 0.01\\ 0.0\\ 0.0\\ 0.02\\ 0.01\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ \end{array}$
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.02           0.03           0.04           0.0	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.13 0.22 0.0 0.0 0.0	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \\ 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ 0.19\\ 0.01\\ 0.1\\ 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ \end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.0 0.0	
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.01           0.01           0.02           0.03           0.04           0.0           0.1	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.32 \\ 0.32 \\ 0.5 \\ 0.0 \\ 0.32 \\ 0.5 \\ 0.0 \\ 0.32 \\ 0.5 \\ 0.5 \\ 0.0 \\ 0.5 \\ 0.0 \\ 0.5 \\$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.13 0.22 0.0 0.0 0.0 0.59	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.34 \\ \hline 0.34 \\ 0.5 \\ 0$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ 0.19\\ 0.01\\ 0.1\\ 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ 0.0\\ 0.2\\ 0.2\\ 0.2\\ 0.2\\ 0.2$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.0 0.0 0.0 0.0 0.0 0.	φ(1020) 0.2 0.04 0.13 0.01 0.0 0.0 0.02 0.01 0.0 0.0 0.0 0.0
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Peaking background	K*(892)           1.0           0.8           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.02	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.32 \\ 0.05 \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.13 0.22 0.0 0.0 0.0 0.59 0.12	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ 0.19\\ 0.01\\ 0.1\\ 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ 0.0\\ 0.2\\ 0.05\\ \end{array}$	Rescattering           0.8           0.22           0.22           0.07           0.0           0.01           0.09           0.04           0.0           0.0           0.14           0.04	$\begin{array}{c} \phi(1020)\\ \hline 0.2\\ \hline 0.04\\ 0.13\\ \hline 0.01\\ 0.0\\ 0.02\\ 0.01\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.0\\ 0.$
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Peaking background         Isobar Model	K*(892)           1.0           0.8           0.01           0.01           0.01           0.02           0.01           0.02	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.32 \\ 0.05 \\ $	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.13 0.22 0.0 0.0 0.0 0.59 0.12	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \\ 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \\ 0.12 \\ 0.11 \\ 0.0 \\$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\\hline 0.19\\0.01\\\hline 0.1\\0.0\\0.02\\0.15\\0.14\\0.0\\0.0\\0.0\\0.2\\0.05\\\hline 0.2\\0.05\\\hline 0.12\\0.05\\\hline 0.12\\0.05\\0.05\\\hline 0.12\\0.05\\\hline 0.0$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.04 0.0 0.0 0.04 0.0 0.0	φ(1020) 0.2 0.04 0.13 0.01 0.0 0.00 0.02 0.01 0.0 0.01 0.0 0.01 0.0
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Peaking background         Isobar Model         Fit bias	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.01           0.02           0.034	$K_0^*(1430)^0$ 1.2 1.17 0.28 0.05 0.01 0.01 0.03 0.05 0.0 0.0 0.02 0.02 0.02 0.02 0.02 0.02	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.0 0.22 0.0 0.0	$\rho(1450)^0$ 1.9 0.63 0.09 0.13 0.01 0.0 0.15 0.01 0.0 0.0 0.34 0.12 0.11 0.11 0.15	$\begin{array}{c} f_2(1270)\\\hline 1.3\\\hline 0.19\\0.01\\\hline 0.1\\0.0\\0.02\\0.15\\0.14\\0.0\\0.0\\\hline 0.2\\0.05\\0.05\\0.09\\0.05\\\hline 0.09\\0.05\\\hline 0.09\\0.09\\0.09\\0.09\\0.09\\0.09\\0.09\\0.09$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.04 0.05 0.5 0.	$\phi(1020)$ 0.2 0.04 0.13 0.01 0.0 0.0 0.0 0.02 0.01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Peaking background         Isobar Model         Fit bias         Blatt Weisskopf radii set in 3 GeV <sup>-1</sup>	$\begin{array}{c} K^{*}(892) \\ \hline 1.0 \\ \hline 0.8 \\ 0.1 \\ 0.07 \\ 0.01 \\ 0.01 \\ 0.09 \\ 0.04 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.02 \\ 0.34 \\ 0.11 \\ 0.01 \\ 0.01 \\ \end{array}$	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.32 \\ 0.05 \\ 0.05 \\ 0.02 \\ 0.57 \\ $	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.03 0.22 0.0 0.0 0.59 0.12 0.27 0.49 0.27 0.49	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \\ \hline 0.11 \\ 0.15 \\ 0.25 \\ \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ \hline 0.19\\ 0.01\\ \hline 0.1\\ 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ \hline 0.2\\ 0.05\\ \hline 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.09\\ 0.05\\ 0.05\\ 0.09\\ 0.05\\ $	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.04 0.04 0.04 0.04 0.04 0.04 0.04 0.031 0.04 0.03 0.04 0.03 0.04 0.03 0.04 0.04 0.03 0.04	φ(1020) 0.2 0.04 0.13 0.01 0.0 0.01 0.02 0.01 0.00 0.01 0.0 0.01 0.0 0.05 0.0 0.05 0.0 0.01
B <sup>−</sup> Fit fraction: FF <sup>−</sup> Statistical uncertainty         B <sup>±</sup> mass fit         Maximum value       Minimum value         Efficiency model       Simulation sample size         PID       L0 trigger correction         Finer binning       Coarse binning         B production and detection asymmetry       MC truth requirement         Background models       Combinatorial background         Peaking background       Isobar Model         Fit bias       Blatt Weisskopf radii set in 3 GeV <sup>-1</sup> Blatt Weisskopf radii set in 5 GeV <sup>-1</sup>	$\begin{array}{c} K^{*}(892) \\ \hline 1.0 \\ \hline 0.8 \\ 0.1 \\ \hline 0.07 \\ 0.01 \\ 0.01 \\ 0.09 \\ 0.04 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.02 \\ \hline 0.34 \\ 0.11 \\ 0.04 \\ 0.0 \\ 0.1 \\ 0.04 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.11 \\ 0.04 \\ 0.04 \\ 0.01 \\ 0.04 \\ 0.01 $	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.32 \\ 0.05 \\ 0.02 \\ 0.57 \\ 0.28 \\ 0.02 \\ 0.57 \\ 0.28 \\ 0.07 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\ 0.07 \\ 0.08 \\$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.13 0.22 0.0 0.0 0.59 0.12 0.27 0.49 0.35 0.55 0.12	$\rho(1450)^0$ 1.9 0.63 0.09 0.13 0.01 0.0 0.15 0.01 0.0 0.0 0.34 0.12 0.11 0.15 0.26 0.2	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ \hline 0.19\\ 0.01\\ \hline 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ \hline 0.2\\ 0.05\\ \hline 0.09\\ 0.05\\ 0.16\\ 0.2\\ 0.02\\ \hline 0.02\\ 0.05\\ 0.16\\ 0.02\\ $	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.14 0.04 0.04 0.04 0.23 0.23	$\phi(1020)$ 0.2 0.04 0.13 0.01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
$B^-$ Fit fraction: FF <sup>-</sup> Statistical uncertainty $B^\pm$ mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Peaking background         Isobar Model         Fit bias         Blatt Weisskopf radii set in 3 GeV <sup>-1</sup> Mass and width variation	$\begin{array}{c} K^{*}(892) \\ \hline 1.0 \\ \hline 0.8 \\ 0.1 \\ \hline 0.07 \\ 0.01 \\ 0.01 \\ 0.09 \\ 0.04 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.02 \\ \hline 0.34 \\ 0.11 \\ 0.04 \\ 0.31 \end{array}$	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.32 \\ 0.05 \\ 0.02 \\ 0.57 \\ 0.28 \\ 0.77 \\ \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.03 0.00 0.59 0.12 0.27 0.49 0.35 4.1	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ 0.63 \\ 0.09 \\ 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \\ 0.11 \\ 0.15 \\ 0.26 \\ 0.8 \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ \hline 0.19\\ 0.01\\ \hline 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ \hline 0.2\\ 0.05\\ \hline 0.09\\ 0.05\\ 0.16\\ 0.26\\ \end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.14 0.04 0.04 0.31 0.23 0.26	$\begin{array}{c} \phi(1020)\\ \hline 0.2\\ \hline 0.04\\ 0.13\\ \hline 0.01\\ 0.0\\ 0.0\\ 0.02\\ 0.01\\ 0.0\\ 0.02\\ 0.01\\ 0.0\\ 0.01\\ 0.0\\ 0.05\\ 0.0\\ 0.01\\ 0.03\\ \end{array}$
$B^-$ Fit fraction: FF <sup>-</sup> Statistical uncertainty $B^\pm$ mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Paking background         Isobar Model         Fit bias         Blatt Weisskopf radii set in 3 GeV <sup>-1</sup> Mass and width variation $\phi$ background level	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.01           0.01           0.02           0.34           0.11           0.02           0.34           0.11           0.04	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.32 \\ 0.05 \\ 0.02 \\ 0.57 \\ 0.28 \\ 0.77 \\ 0.28 \\ 0.77 \\ 0.26 \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.02 0.00 0.00 0.59 0.12 0.27 0.49 0.35 4.1 0.24	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \\ \hline 0.11 \\ 0.15 \\ 0.26 \\ 0.8 \\ \hline 0.02 \\ \hline 0.02 \\ \hline 0.02 \\ 0.03 \\ \hline 0.03 \\ 0.03 \\ 0.03 \\ \hline 0.03 \\ 0.03$	$\begin{array}{c} f_2(1270)\\\hline 1.3\\\hline 0.19\\0.01\\\hline 0.1\\0.0\\0.02\\0.15\\0.14\\0.0\\0.0\\0.0\\0.0\\0.0\\0.05\\0.05\\0.06\\0.26\\0.26\\0.26\\0.26\\0.22\\0.02\\0.05\\0.02\\0.05\\0.02\\0.05\\0.02\\0.02$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.0 0.14 0.04 0.31 0.23 0.26 0.11	$\phi(1020)$ 0.2 0.04 0.13 0.01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
$B^-$ Fit fraction: FF <sup>-</sup> Statistical uncertainty $B^\pm$ mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Peaking background         Isobar Model         Fit bias         Blatt Weisskopf radii set in 3 GeV <sup>-1</sup> Blatt Weisskopf radii set in 5 GeV <sup>-1</sup> Mass and width variation $\phi$ background level         Upward	$\begin{array}{c} K^{*}(892) \\ \hline 1.0 \\ \hline 0.8 \\ 0.1 \\ 0.07 \\ 0.01 \\ 0.01 \\ 0.09 \\ 0.04 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.02 \\ 0.34 \\ 0.11 \\ 0.04 \\ 0.31 \\ 0.03 \\ $	$K_0^*(1430)^0$ 1.2 1.17 0.28 0.05 0.01 0.01 0.03 0.05 0.0 0.00 0.02 0.57 0.28 0.77 0.28 0.77 0.9 0.01	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.0 0.0 0.0 0.59 0.12 0.27 0.49 0.35 4.1 0.24 0.24 0.24	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \\ \hline 0.11 \\ 0.15 \\ 0.26 \\ 0.8 \\ 0.03 \\ 0.01 \\ \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ \hline 0.19\\ 0.01\\ \hline 0.1\\ 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ \hline 0.2\\ 0.05\\ \hline 0.09\\ 0.05\\ 0.16\\ 0.26\\ \hline 0.02\\ $	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.04 0.04 0.04 0.04 0.04 0.04 0.23 0.26 0.11 0.14	$\phi(1020)$ 0.2 0.04 0.13 0.01 0.0 0.0 0.02 0.01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
$B^-$ Fit fraction: FF <sup>-</sup> Statistical uncertainty $B^\pm$ mass fit         Maximum value         Minimum value         Efficiency model         Simulation sample size         PID         L0 trigger correction         Finer binning         Coarse binning         B production and detection asymmetry         MC truth requirement         Background models         Combinatorial background         Peaking background         Isobar Model         Fit bias         Blatt Weisskopf radii set in 3 GeV <sup>-1</sup> Mass and width variation $\phi$ background level         Upward         Downward	$\begin{array}{c} K^{*}(892) \\ \hline 1.0 \\ \hline 0.8 \\ 0.1 \\ 0.07 \\ 0.01 \\ 0.01 \\ 0.09 \\ 0.04 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.1 \\ 0.02 \\ 0.34 \\ 0.11 \\ 0.04 \\ 0.31 \\ 0.03 \\ 0.03 \\ 0.04 \\ 0.04 \\ \end{array}$	$\begin{array}{c} K_0^*(1430)^0 \\ \hline 1.2 \\ \hline 1.17 \\ 0.28 \\ 0.05 \\ 0.01 \\ 0.01 \\ 0.03 \\ 0.05 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.05 \\ 0.02 \\ 0.57 \\ 0.28 \\ 0.77 \\ 0.09 \\ 0.1 \\ 0.20 \\ \end{array}$	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.03 0.22 0.0 0.0 0.59 0.12 0.27 0.49 0.35 4.1 0.24 0.26 0.27	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \\ \hline 0.11 \\ 0.15 \\ 0.26 \\ 0.8 \\ \hline 0.03 \\ 0.01 \\ 0.550 \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ \hline 0.19\\ 0.01\\ \hline 0.1\\ 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ \hline 0.2\\ 0.05\\ 0.05\\ 0.05\\ 0.05\\ 0.05\\ 0.06\\ 0.26\\ \hline 0.02\\ 0.03\\ 0.74\\ \hline \end{array}$	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.04 0.04 0.04 0.04 0.04 0.23 0.26 0.11 0.14 0.23 0.26 0.11 0.14 0.23 0.26 0.11 0.14	$\phi(1020)$ 0.2 0.04 0.13 0.01 0.0 0.0 0.02 0.01 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.
$\begin{array}{c} B^- \mbox{ Fit fraction: FF}^- \\ \hline \begin{tabular}{lllllllllllllllllllllllllllllllllll$	K*(892)           1.0           0.8           0.1           0.07           0.01           0.01           0.01           0.01           0.01           0.01           0.01           0.02           0.34           0.11           0.04           0.31           0.03           0.03           0.04	$K_0^*(1430)^0$ 1.2 1.17 0.28 0.05 0.01 0.01 0.03 0.05 0.00 0.0 0.02 0.57 0.28 0.77 0.09 0.1 0.39 1.2	Single pole 2.6 2.61 0.57 0.13 0.02 0.02 0.02 0.13 0.22 0.0 0.0 0.59 0.12 0.27 0.49 0.35 4.1 0.24 0.26 0.37 0.24 0.26	$\begin{array}{c} \rho(1450)^0 \\ \hline 1.9 \\ \hline 0.63 \\ 0.09 \\ \hline 0.13 \\ 0.01 \\ 0.0 \\ 0.15 \\ 0.01 \\ 0.0 \\ 0.0 \\ 0.34 \\ 0.12 \\ \hline 0.11 \\ 0.15 \\ 0.26 \\ 0.8 \\ \hline 0.03 \\ 0.01 \\ 0.59 \\ \hline 1.20 \end{array}$	$\begin{array}{c} f_2(1270)\\ \hline 1.3\\ \hline 0.19\\ 0.01\\ \hline 0.0\\ 0.02\\ 0.15\\ 0.14\\ 0.0\\ 0.0\\ 0.0\\ \hline 0.2\\ 0.05\\ \hline 0.02\\ 0.05\\ 0.16\\ 0.26\\ \hline 0.02\\ 0.03\\ 0.74\\ \hline 0.02\\ 0.03\\ 0.74\\ \hline 0.02\\ 0.03\\ 0.74\\ \hline 0.02\\ 0.03\\ \hline 0.74\\ \hline 0.02\\ 0.03\\ \hline 0.74\\ \hline 0.02\\ \hline 0.03\\ \hline 0.74\\ \hline 0.02\\ \hline 0.03\\ \hline 0.74\\ \hline 0.02\\ \hline 0.03\\ $	Rescattering 0.8 0.22 0.22 0.07 0.0 0.01 0.09 0.04 0.0 0.0 0.14 0.04 0.04 0.23 0.26 0.11 0.14 0.13 0.23	$\phi(1020)$ 0.2 0.04 0.13 0.01 0.0 0.0 0.02 0.01 0.0 0.0 0.0 0.01 0.0 0.0 0.0 0.0 0

# Table 9: Systematic uncertainties for $B^+$ and $B^-$ fit fractions (in percent).

D+			Resor	ant Compo	nents		
<i>B</i> magnitude: <i>a</i>	$K^{*}(892)$	$K_0^*(1430)^0$	Single pole	$\rho(1450)^0$	$f_2(1270)$	Rescattering	$\phi(1020)$
Statistical uncertainty	0.04	0.09	0.13	0.11	0.09	0.09	0.07
$B^{\pm}$ mass fit							
Maximum value	0.01	0.04	0.1	0.05	0.02	0.01	0.0
Minimum value	0.0	0.01	0.02	0.01	0.01	0.02	0.0
Efficiency model							
Simulation sample size	0.0	0.01	0.01	0.01	0.01	0.01	0.0
PID	0.01	0.01	0.02	0.02	0.01	0.02	0.0
L0 trigger correction	0.0	0.0	0.0	0.01	0.0	0.01	0.0
Finer binning	0.0	0.0	0.0	0.0	0.0	0.01	0.0
Coarse binning	0.0	0.01	0.01	0.0	0.01	0.01	0.0
B production and detection asymmetry	0.01	0.01	0.02	0.02	0.01	0.02	0.0
MC truth requirement	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background models							
Combinatorial background	0.01	0.02	0.03	0.02	0.02	0.02	0.0
Peaking background	0.0	0.0	0.01	0.01	0.0	0.0	0.0
Isobar Model							
Fit bias	0.0	0.01	0.03	0.02	0.01	0.02	0.01
Blatt Weisskopf radii set in 3 $\text{GeV}^{-1}$	0.0	0.02	0.0	0.0	0.02	0.01	0.01
Blatt Weisskopf radii set in 5 $GeV^{-1}$	0.0	0.02	0.0	0.0	0.01	0.01	0.0
Mass and width variation	0.0	0.08	0.13	0.04	0.02	0.03	0.01
$\phi$ background level							
Upward	0.0	0.0	0.01	0.0	0.01	0.01	0.0
Downward	0.0	0.0	0.01	0.01	0.01	0.01	0.0
$\rho(1450)$ free to float in the fit	0.01	0.01	0.03	0.0	0.05	0.01	0.02
Total systematic uncertainty	0.02	0.09	0.17	0.07	0.07	0.06	0.02
$B^-$ magnitude: $a^-$	$K^{*}(892)$	$K_0^*(1430)^0$	Single pole	$\rho(1450)^0$	$f_2(1270)$	Rescattering	$\phi(1020)$
Statistical uncertainty	0.04	0.09	0.12	0.10	0.08	0.07	0.06
$B^{\pm}$ mass fit							
Maximum value	0.01	0.06	0.14	0.04	0.02	0.01	0.02
Minimum value	0.0	0.02	0.02	0.0	0.0	0.01	0.03
Efficiency model							
Simulation sample size	0.0	0.0	0.01	0.01	0.01	0.01	0.0
PID	0.01	0.01	0.02	0.02	0.01	0.01	0.0
L0 trigger correction	0.0	0.0	0.01	0.01	0.0	0.0	0.0
Finer binning	0.0	0.0	0.0	0.0	0.01	0.01	0.0
Coarse binning	0.0	0.0	0.01	0.0	0.01	0.0	0.0
B production and detection asymmetry	0.01	0.01	0.01	0.01	0.01	0.01	0.0
MC truth requirement	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Background models							
Combinatorial background	0.01	0.02	0.02	0.02	0.01	0.01	0.0
Peaking background	0.0	0.0	0.01	0.0	0.0	0.0	0.0
Isobar Model							
Fit bias	0.0	0.01	0.03	0.02	0.02	0.01	0.0
Blatt Weisskopf radii set in $3 \text{ GeV}^{-1}$	0.0	0.04	0.02	0.01	0.0	0.02	0.0
Blatt Weisskopf radii set in 5 $\text{GeV}^{-1}$	0.0	0.02	0.01	0.01	0.01	0.02	0.0
Mass and width variation	0.0	0.06	0.14	0.03	0.02	0.02	0.01
$\phi$ background level	0.7	0.55	0.51	0.5	0.7	0.07	0.55
Upward	0.0	0.01	0.01	0.0	0.0	0.01	0.02
Downward	0.0	0.01	0.01	0.0	0.0	0.01	0.02
$\rho(1450)$ tree to float in the fit	0.01	0.03	0.0	0.03	0.04	0.0	0.0
Total systematic uncertainty	0.02	0.10	0.20	0.07	0.05	0.04	0.04

# Table 10: Systematic uncertainties for $B^+$ and $B^-$ magnitudes.

				Component			
$B^+$ phase: $\delta^+$	$K^{*}(892)$	$K_0^*(1430)^0$	Single pole	$\rho(1450)^0$	$f_2(1270)$	Rescattering	$\phi(1020)$
Statistical uncertainty	0 [fixed]	10	7	10	11	12	23
$B^{\pm}$ mass fit							
Maximum value	_	1.13	2.6	1.48	0.18	0.98	3.56
Minimum value	_	0.47	0.07	1.04	1.65	2.07	1.56
Efficiency model							
Simulation sample size	_	0.72	0.55	0.7	0.92	1.06	1.75
PID	_	1.58	1.38	1.12	1.12	1.1	1.07
L0 trigger correction	_	0.66	0.58	0.49	0.42	0.43	0.58
Finer binning	_	0.39	0.4	0.9	1.17	1.74	1.3
Coarse binning	_	0.38	0.74	0.27	0.35	0.24	0.36
<i>B</i> production and detection asymmetry	_	0.01	0.0	0.01	0.02	0.01	0.02
MC truth requirement	_	0.04	0.04	0.04	0.04	0.05	0.08
Background models							
Combinatorial background	_	2.57	1.66	3.03	3.09	3.04	3.16
Peaking background	_	0.52	0.32	0.41	0.48	0.53	0.55
Isobar model							
Fit bias	_	0.07	0.3	0.06	0.34	0.06	0.08
Blatt Weisskopf radii set in 3 GeV <sup>-1</sup>	_	0.95	1.35	0.28	6.01	0.97	4.81
Blatt Weisskopf radii set in 5 GeV <sup>-1</sup>	_	0.41	0.62	0.17	3.32	0.3	3.48
Mass and width variation	_	14.37	2.7	6.78	4.92	6.94	10.55
$\phi$ background level							
Upward	_	0.13	0.0	0.22	0.55	0.75	0.37
Downward	_	0.12	0.01	0.28	0.66	0.92	0.55
$\rho(1450)$ free to float in the fit	_	4.72	1.91	12.39	1.41	15.87	29.02
Total systematic uncertainty	-	15.55	5.10	14.66	9.51	17.96	31.95
$B^-$ phase: $\delta^-$	$K^{*}(892)$	$K_0^*(1430)^0$	Single pole	$\rho(1450)^{0}$	$f_2(1270)$	Rescattering	$\phi(1020)$
Statistical uncertainty	0 [fixed]	11	6	13	11	14	33
$B^{\pm}$ mass fit							
Maximum value	_	2.15	0.85	2.94	3.36	3.85	2.25
Minimum value	_	1.0	0.48	2.52	2.75	3.51	4.94
Efficiency model							
Simulation sample size	_	0.61	0.41	0.71	0.74	0.88	1.16
PID	_	0.13	0.09	0.11	0.1	0.11	0.12
L0 trigger correction	_	0.48	0.42	0.2	0.15	0.15	0.19
Finer binning	_	0.06	0.34	0.44	0.77	0.33	2.07
Coarse binning	_	0.54	0.59	0.17	0.24	0.31	0.99
B production and detection asymmetry	_	0.0	0.0	0.02	0.02	0.02	0.04
MC truth requirement	_	0.03	0.02	0.01	0.01	0.01	0.02
Background models							
Combinatorial background	-	2.26	1.48	4.46	3.96	4.35	5.56
Peaking background	-	0.55	0.27	0.64	0.62	0.67	0.85
Isobar Model							
Fit bias	-	0.8	0.02	0.89	0.07	1.42	0.11
Blatt Weisskopf radii set in 3 $\text{GeV}^{-1}$	_	0.83	0.94	3.16	8.64	4.99	6.69
Blatt Weisskopf radii set in 5 $GeV^{-1}$	_	0.5	0.49	1.07	4.57	2.11	4.8
Mass and width variation	-	20.99	3.62	9.81	8.37	9.26	11.87
$\phi$ background level							
Upward	-	0.31	0.11	0.66	0.85	1.27	1.34
Downward	-	0.3	0.1	0.75	0.95	1.4	2.15
$\rho(1450)$ free to float in the fit	-	0.49	1.69	15.9	0.78	7.47	37.67
	_	21.31	4.59	19.95	14.28	14 96	41 28

# Table 11: Systematic uncertainties for $B^-$ and $B^-$ phases (in degrees).