

**$K^*(1680)$** 

$$I(J^P) = \frac{1}{2}(1^-)$$

 **$K^*(1680)$  MASS**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
<b>1718±18 OUR AVERAGE</b>					
1722±20 <sup>+33</sup> <sub>-109</sub>	4289	<sup>1</sup> AAIJ	17C	LHCB	$B^+ \rightarrow J/\psi \phi K^+$
1677±10±32		ASTON	88	LASS 0	11 $K^- p \rightarrow$ $K^- \pi^+ n$
1735±10±20		ASTON	87	LASS 0	11 $K^- p \rightarrow$ $\bar{K}^0 \pi^+ \pi^- n$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
1678±64		BIRD	89	LASS -	11 $K^- p \rightarrow \bar{K}^0 \pi^- p$
1800±70		ETKIN	80	MPS 0	6 $K^- p \rightarrow$ $\bar{K}^0 \pi^+ \pi^- n$
~ 1650		ESTABROOKS 78	ASPK 0	13	$K^\pm p \rightarrow$ $K^\pm \pi^\pm n$

<sup>1</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of 8.5  $\sigma$ . **$K^*(1680)$  WIDTH**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
<b>322±110 OUR AVERAGE</b>					
Error includes scale factor of 4.2.					
354±75 <sup>+140</sup> <sub>-181</sub>	4289	<sup>2</sup> AAIJ	17C	LHCB	$B^+ \rightarrow J/\psi \phi K^+$
205±16±34		ASTON	88	LASS 0	11 $K^- p \rightarrow$ $K^- \pi^+ n$
423±18±30		ASTON	87	LASS 0	11 $K^- p \rightarrow$ $\bar{K}^0 \pi^+ \pi^- n$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
454±270		BIRD	89	LASS -	11 $K^- p \rightarrow \bar{K}^0 \pi^- p$
170±30		ETKIN	80	MPS 0	6 $K^- p \rightarrow$ $\bar{K}^0 \pi^+ \pi^- n$
250 to 300		ESTABROOKS 78	ASPK 0	13	$K^\pm p \rightarrow$ $K^\pm \pi^\pm n$

<sup>2</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of 8.5  $\sigma$ . **$K^*(1680)$  DECAY MODES**

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $K\pi$	(38.7±2.5) %
$\Gamma_2$ $K\rho$	(31.4 <sup>+5.0</sup> <sub>-2.1</sub> ) %
$\Gamma_3$ $K^*(892)\pi$	(29.9 <sup>+2.2</sup> <sub>-5.0</sub> ) %
$\Gamma_4$ $K\phi$	seen

**CONSTRAINED FIT INFORMATION**

An overall fit to 4 branching ratios uses 4 measurements and one constraint to determine 3 parameters. The overall fit has a  $\chi^2 = 2.9$  for 2 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients  $\langle \delta x_i \delta x_j \rangle / (\delta x_i \delta x_j)$ , in percent, from the fit to the branching fractions,  $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$ . The fit constrains the  $x_i$  whose labels appear in this array to sum to one.

$x_2$	-36	
$x_3$	-39	-72
	$x_1$	$x_2$

 **$K^*(1680)$  BRANCHING RATIOS**

**$\Gamma(K\pi)/\Gamma_{\text{total}}$   $\Gamma_1/\Gamma$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
<b><math>0.387 \pm 0.026</math> OUR FIT</b>				
<b><math>0.388 \pm 0.014 \pm 0.022</math></b>	ASTON	88	LASS	0 11 $K^- p \rightarrow K^- \pi^+ n$

**$\Gamma(K\pi)/\Gamma(K^*(892)\pi)$   $\Gamma_1/\Gamma_3$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
<b><math>1.30^{+0.23}_{-0.14}</math> OUR FIT</b>				
<b><math>2.8 \pm 1.1</math></b>	ASTON	84	LASS	0 11 $K^- p \rightarrow \bar{K}^0 2\pi n$

**$\Gamma(K\rho)/\Gamma(K\pi)$   $\Gamma_2/\Gamma_1$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
<b><math>0.81^{+0.14}_{-0.09}</math> OUR FIT</b>				
<b><math>1.2 \pm 0.4</math></b>	ASTON	84	LASS	0 11 $K^- p \rightarrow \bar{K}^0 2\pi n$

**$\Gamma(K\rho)/\Gamma(K^*(892)\pi)$   $\Gamma_2/\Gamma_3$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
<b><math>1.05^{+0.27}_{-0.11}</math> OUR FIT</b>				
<b><math>0.97 \pm 0.09^{+0.30}_{-0.10}</math></b>	ASTON	87	LASS	0 11 $K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$

**$\Gamma(K\phi)/\Gamma_{\text{total}}$   $\Gamma_4/\Gamma$**

<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>seen</b>	4289	<sup>3</sup> AAIJ	17C	LHCB $B^+ \rightarrow J/\psi \phi K^+$

<sup>3</sup>From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of  $8.5 \sigma$ .

## **$K^*(1680)$ REFERENCES**

AAIJ	17C	PRL 118 022003	R. Aaij <i>et al.</i>	(LHCb Collab.)
Also		PR D95 012002	R. Aaij <i>et al.</i>	(LHCb Collab.)
BIRD	89	SLAC-332	P.F. Bird	(SLAC)
ASTON	88	NP B296 493	D. Aston <i>et al.</i>	(SLAC, NAGO, CINC, INUS)
ASTON	87	NP B292 693	D. Aston <i>et al.</i>	(SLAC, NAGO, CINC, INUS)
ASTON	84	PL 149B 258	D. Aston <i>et al.</i>	(SLAC, CARL, OTTA) JP
ETKIN	80	PR D22 42	A. Etkin <i>et al.</i>	(BNL, CUNY) JP
ESTABROOKS	78	NP B133 490	P.G. Estabrooks <i>et al.</i>	(MCGI, CARL, DURH+) JP

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