

# K<sub>2</sub>(1770)

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

See our mini-review in the 2004 edition of this Review, PDG 04.

## K<sub>2</sub>(1770) MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
<b>1773 ± 8 OUR AVERAGE</b>					
1777 ± 35 <sup>+122</sup> <sub>-77</sub>	4289	<sup>1</sup> AAIJ	17C	LHCB	B <sup>+</sup> → J/ψ φ K <sup>+</sup>
1773 ± 8		<sup>2</sup> ASTON	93	LASS	11K <sup>-</sup> p → K <sup>-</sup> ωp
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
1743 ± 15		TIKHOMIROV 03	SPEC		40.0 π <sup>-</sup> C → K <sub>S</sub> <sup>0</sup> K <sub>S</sub> <sup>0</sup> K <sub>L</sub> <sup>0</sup> X
1810 ± 20		FRAME 86	OMEG +		13 K <sup>+</sup> p → φ K <sup>+</sup> p
~ 1730		ARMSTRONG 83	OMEG -		18.5 K <sup>-</sup> p → 3Kp
~ 1780		<sup>3</sup> DAUM 81C	CNTR -		63 K <sup>-</sup> p → K <sup>-</sup> 2πp
1710 ± 15	60	CHUNG 74	HBC -		7.3 K <sup>-</sup> p → K <sup>-</sup> ωp
1767 ± 6		BLIEDEN 72	MMS -		11-16 K <sup>-</sup> p
1730 ± 20	306	<sup>4</sup> FIRESTONE 72B	DBC +		12 K <sup>+</sup> d
1765 ± 40		<sup>5</sup> COLLEY 71	HBC +		10 K <sup>+</sup> p → K2πN
1740		DENEGRI 71	DBC -		12.6 K <sup>-</sup> d → $\overline{K}2\pi d$
1745 ± 20		AGUILAR-...	70C HBC -		4.6 K <sup>-</sup> p
1780 ± 15		BARTSCH 70C	HBC -		10.1 K <sup>-</sup> p
1760 ± 15		LUDLAM 70	HBC -		12.6 K <sup>-</sup> p

<sup>1</sup> From an amplitude analysis of the decay B<sup>+</sup> → J/ψ φ K<sup>+</sup> with a significance of 5.0 σ.

<sup>2</sup> From a partial wave analysis of the K<sup>-</sup>ω system.

<sup>3</sup> From a partial wave analysis of the K<sup>-</sup>2π system.

<sup>4</sup> Produced in conjunction with excited deuteron.

<sup>5</sup> Systematic errors added correspond to spread of different fits.

## K<sub>2</sub>(1770) WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
<b>186 ± 14 OUR AVERAGE</b>					
217 ± 116 <sup>+221</sup> <sub>-154</sub>	4289	<sup>6</sup> AAIJ	17C	LHCB	B <sup>+</sup> → J/ψ φ K <sup>+</sup>
186 ± 14		<sup>7</sup> ASTON	93	LASS	11K <sup>-</sup> p → K <sup>-</sup> ωp
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
147 ± 70		TIKHOMIROV 03	SPEC		40.0 π <sup>-</sup> C → K <sub>S</sub> <sup>0</sup> K <sub>S</sub> <sup>0</sup> K <sub>L</sub> <sup>0</sup> X
140 ± 40		FRAME 86	OMEG +		13 K <sup>+</sup> p → φ K <sup>+</sup> p
~ 220		ARMSTRONG 83	OMEG -		18.5 K <sup>-</sup> p → 3Kp
~ 210		<sup>8</sup> DAUM 81C	CNTR -		63 K <sup>-</sup> p → K <sup>-</sup> 2πp
110 ± 50	60	CHUNG 74	HBC -		7.3 K <sup>-</sup> p → K <sup>-</sup> ωp
100 ± 26		BLIEDEN 72	MMS -		11-16 K <sup>-</sup> p

210 ± 30	306	<sup>9</sup> FIRESTONE	72B	DBC	+	12 $K^+ d$
90 ± 70		<sup>10</sup> COLLEY	71	HBC	+	10 $K^+ p \rightarrow K 2\pi N$
130		DENEGRI	71	DBC	-	12.6 $K^- d \rightarrow \overline{K} 2\pi d$
100 ± 50		AGUILAR-...	70C	HBC	-	4.6 $K^- p$
138 ± 40		BARTSCH	70C	HBC	-	10.1 $K^- p$
50 <sup>+</sup> <sub>-</sub> 40 20		LUDLAM	70	HBC	-	12.6 $K^- p$

<sup>6</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of  $5.0 \sigma$ .

<sup>7</sup> From a partial wave analysis of the  $K^- \omega$  system.

<sup>8</sup> From a partial wave analysis of the  $K^- 2\pi$  system.

<sup>9</sup> Produced in conjunction with excited deuteron.

<sup>10</sup> Systematic errors added correspond to spread of different fits.

## $K_2(1770)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $K \pi \pi$	
$\Gamma_2$ $K_2^*(1430) \pi$	seen
$\Gamma_3$ $K^*(892) \pi$	seen
$\Gamma_4$ $K f_2(1270)$	seen
$\Gamma_5$ $K f_0(980)$	
$\Gamma_6$ $K \phi$	seen
$\Gamma_7$ $K \omega$	seen

## $K_2(1770)$ BRANCHING RATIOS

$\Gamma(K_2^*(1430)\pi)/\Gamma(K\pi\pi)$   $\Gamma_2/\Gamma_1$   
 ( $K_2^*(1430) \rightarrow K\pi$ )

VALUE	DOCUMENT ID	TECN	CHG	COMMENT	
•••	We do not use the following data for averages, fits, limits, etc. •••				
~ 0.03	DAUM	81C	CNTR	63 $K^- p \rightarrow K^- 2\pi p$	
~ 1.0	<sup>11</sup> FIRESTONE	72B	DBC	+	12 $K^+ d$
<1.0	COLLEY	71	HBC		10 $K^+ p$
0.2 ± 0.2	AGUILAR-...	70C	HBC	-	4.6 $K^- p$
<1.0	BARTSCH	70C	HBC	-	10.1 $K^- p$
1.0	BARBARO-...	69	HBC	+	12.0 $K^+ p$

<sup>11</sup> Produced in conjunction with excited deuteron.

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

VALUE	DOCUMENT ID	TECN	COMMENT
•••	We do not use the following data for averages, fits, limits, etc. •••		
~ 0.23	DAUM	81C	CNTR 63 $K^- p \rightarrow K^- 2\pi p$

$\Gamma(K f_2(1270))/\Gamma(K\pi\pi)$   $\Gamma_4/\Gamma_1$   
 ( $f_2(1270) \rightarrow \pi\pi$ )

VALUE	DOCUMENT ID	TECN	COMMENT
•••	We do not use the following data for averages, fits, limits, etc. •••		
~ 0.74	DAUM	81C	CNTR 63 $K^- p \rightarrow K^- 2\pi p$

$\Gamma(K f_0(980))/\Gamma_{\text{total}}$   $\Gamma_5/\Gamma$

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
possibly seen	TIKHOMIROV 03	SPEC	40.0 $\pi^- C \rightarrow K_S^0 K_S^0 K_L^0 X$

$\Gamma(K \phi)/\Gamma_{\text{total}}$   $\Gamma_6/\Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
seen	24k	<sup>12</sup> AAIJ	21E	LHCB	$B^+ \rightarrow J/\psi \phi K^+$
<b>seen</b>		ARMSTRONG 83	OMEG	-	18.5 $K^- p \rightarrow K^- \phi N$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	4289	<sup>13,14</sup> AAIJ	17C	LHCB	$B^+ \rightarrow J/\psi \phi K^+$

<sup>12</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of 7.9  $\sigma$ .

<sup>13</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of 5.0  $\sigma$ .

<sup>14</sup> Superseded by AAIJ 21E.

$\Gamma(K \omega)/\Gamma_{\text{total}}$   $\Gamma_7/\Gamma$

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
<b>seen</b>	OTTER	81	HBC	$\pm$ 8.25,10,16 $K^\pm p$
<b>seen</b>	CHUNG	74	HBC	- 7.3 $K^- p \rightarrow K^- \omega p$

**$K_2(1770)$  REFERENCES**

AAIJ	21E	PRL 127 082001	R. Aaij <i>et al.</i>	(LHCb Collab.)
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.)
PDG	04	PL B592 1	S. Eidelman <i>et al.</i>	(PDG Collab.)
TIKHOMIROV	03	PAN 66 828	G.D. Tikhomirov <i>et al.</i>	
		Translated from YAF 66 860.		
ASTON	93	PL B308 186	D. Aston <i>et al.</i>	(SLAC, NAGO, CINC, INUS)
FRAME	86	NP B276 667	D. Frame <i>et al.</i>	(GLAS)
ARMSTRONG	83	NP B221 1	T.A. Armstrong <i>et al.</i>	(BARI, BIRM, CERN+)
DAUM	81C	NP B187 1	C. Daum <i>et al.</i>	(AMST, CERN, CRAC, MPIM+)
OTTER	81	NP B181 1	G. Otter	(AACH3, BERL, LOIC, VIEN, BIRM+)
CHUNG	74	PL 51B 413	S.U. Chung <i>et al.</i>	(BNL)
BLIEDEN	72	PL 39B 668	H.R. Blieden <i>et al.</i>	(STON, NEAS)
FIRESTONE	72B	PR D5 505	A. Firestone <i>et al.</i>	(LBL)
COLLEY	71	NP B26 71	D.C. Colley <i>et al.</i>	(BIRM, GLAS)
DENEGRI	71	NP B28 13	D. Denegri <i>et al.</i>	(JHU) JP
AGUILAR-...	70C	PRL 25 54	M. Aguilar-Benitez <i>et al.</i>	(BNL)
BARTSCH	70C	PL 33B 186	J. Bartsch <i>et al.</i>	(AACH, BERL, CERN+)
LUDLAM	70	PR D2 1234	T. Ludlam, J. Sandweiss, A.J. Slaughter	(YALE)
BARBARO-...	69	PRL 22 1207	A. Barbaro-Galtieri <i>et al.</i>	(LRL)