

**$K_0^*(1430)$** 

$$I(J^P) = \frac{1}{2}(0^+)$$

See our minireview in the 1994 edition and in this edition under the  $f_0(500)$ . **$K_0^*(1430)$  MASS**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
<b>1425 ±50</b>					<b>OUR ESTIMATE</b>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
1427 ± 4 ±13		<sup>1</sup> BUGG	10	RVUE	S-matrix pole
1466.6 ± 0.7 ± 3.4	141k	<sup>2</sup> BONVICINI	08A	CLEO	$D^+ \rightarrow K^- \pi^+ \pi^+$
~ 1412		<sup>3</sup> LINK	07	FOCS	0 $D^+ \rightarrow K^- K^+ \pi^+$
1461.0 ± 4.0 ± 2.1	54k	<sup>4</sup> LINK	07B	FOCS	$D^+ \rightarrow K^- \pi^+ \pi^+$
1406 ±29		<sup>5</sup> BUGG	06	RVUE	
1435 ± 6		<sup>6</sup> ZHOU	06	RVUE	$K p \rightarrow K^- \pi^+ n$
1455 ±20 ±15		ABLIKIM	05Q	BES2	$\psi(2S) \rightarrow$ $\gamma \pi^+ \pi^- K^+ K^-$
1456 ± 8		<sup>7</sup> ZHENG	04	RVUE	$K^- p \rightarrow K^- \pi^+ n$
~ 1419		<sup>8</sup> BUGG	03	RVUE	<sup>11</sup> $K^- p \rightarrow K^- \pi^+ n$
~ 1440		<sup>9</sup> LI	03	RVUE	<sup>11</sup> $K^- p \rightarrow K^- \pi^+ n$
1459 ± 9	15k	<sup>10</sup> AITALA	02	E791	$D^+ \rightarrow K^- \pi^+ \pi^+$
~ 1440		<sup>11</sup> JAMIN	00	RVUE	$K p \rightarrow K p$
1436 ± 8		<sup>12</sup> BARBERIS	98E	OMEG	450 $p p \rightarrow$ $p_f p_s K^+ K^- \pi^+ \pi^-$
1415 ±25		<sup>8</sup> ANISOVICH	97C	RVUE	<sup>11</sup> $K^- p \rightarrow K^- \pi^+ n$
~ 1450		<sup>13</sup> TORNQVIST	96	RVUE	$\pi \pi \rightarrow \pi \pi, K \bar{K}, K \pi$
1412 ± 6		<sup>14</sup> ASTON	88	LASS	0 <sup>11</sup> $K^- p \rightarrow K^- \pi^+ n$
~ 1430		BAUBILLIER	84B	HBC	- 8.25 $K^- p \rightarrow \bar{K}^0 \pi^- p$
~ 1425		<sup>15,16</sup> ESTABROOKS	78	ASPK	<sup>13</sup> $K^\pm p \rightarrow$ $K^\pm \pi^\pm (n, \Delta)$
~ 1450.0		MARTIN	78	SPEC	<sup>10</sup> $K^\pm p \rightarrow K_S^0 \pi p$

<sup>1</sup> S-Matrix pole. Supersedes BUGG 06. Combined analysis of ASTON 88, ABLIKIM 06C, AITALA 06, and LINK 09 using an  $s$ -dependent width with couplings to  $K\pi$  and  $K\eta'$ , and the Adler zero near thresholds.

<sup>2</sup> From the isobar model with a complex pole for the  $\kappa$ .

<sup>3</sup> From a non-parametric analysis.

<sup>4</sup> A Breit-Wigner mass and width.

<sup>5</sup> S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C including the  $\kappa$  with an  $s$ -dependent width and an Adler zero near threshold.

<sup>6</sup> S-matrix pole. Using ASTON 88 and assuming  $K_0^*(800)$ ,  $K_0^*(1950)$ .

<sup>7</sup> Using ASTON 88 and assuming  $K_0^*(800)$ .

<sup>8</sup> T-matrix pole. Reanalysis of ASTON 88 data.

<sup>9</sup> Breit-Wigner fit. Using ASTON 88.

<sup>10</sup> Assuming a low-mass scalar  $K\pi$  resonance,  $\kappa(800)$ .

<sup>11</sup> T-matrix pole. Using data from ESTABROOKS 78 and ASTON 88.

<sup>12</sup>  $J^P$  not determined, could be  $K_2^*(1430)$ .

<sup>13</sup> T-matrix pole.

<sup>14</sup> Uses a model for the background, without this background they get a mass 1340 MeV, where the phase shift passes 90°.

<sup>15</sup> Mass defined by pole position.

<sup>16</sup> From elastic  $K\pi$  partial-wave analysis.

## $K_0^*(1430)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
<b>270 ±80</b>					<b>OUR ESTIMATE</b>
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
270 ±10 ±40		<sup>17</sup> BUGG	10	RVUE	S-matrix pole
174.2 ± 1.9 ± 3.2	141k	<sup>18</sup> BONVICINI	08A	CLEO	$D^+ \rightarrow K^- \pi^+ \pi^+$
~ 500		<sup>19</sup> LINK	07	FOCS 0	$D^+ \rightarrow K^- K^+ \pi^+$
177.0 ± 8.0 ± 3.4	54k	<sup>20</sup> LINK	07B	FOCS	$D^+ \rightarrow K^- \pi^+ \pi^+$
350 ±40		<sup>21</sup> BUGG	06	RVUE	
288 ±22		<sup>22</sup> ZHOU	06	RVUE	$Kp \rightarrow K^- \pi^+ n$
270 ±45 <sup>+30</sup> / <sub>-35</sub>		ABLIKIM	05Q	BES2	$\psi(2S) \rightarrow$ $\gamma \pi^+ \pi^- K^+ K^-$
217 ±31		<sup>23</sup> ZHENG	04	RVUE	$K^- p \rightarrow K^- \pi^+ n$
~ 316		<sup>24</sup> BUGG	03	RVUE	$11 K^- p \rightarrow K^- \pi^+ n$
~ 350		<sup>25</sup> LI	03	RVUE	$11 K^- p \rightarrow K^- \pi^+ n$
175 ±17	15k	<sup>26</sup> AITALA	02	E791	$D^+ \rightarrow K^- \pi^+ \pi^+$
~ 300		<sup>27</sup> JAMIN	00	RVUE	$Kp \rightarrow Kp$
196 ±45		<sup>28</sup> BARBERIS	98E	OMEG	$450 p p \rightarrow$ $p_f p_s K^+ K^- \pi^+ \pi^-$
330 ±50		<sup>24</sup> ANISOVICH	97C	RVUE	$11 K^- p \rightarrow K^- \pi^+ n$
~ 320		<sup>29</sup> TORNQVIST	96	RVUE	$\pi\pi \rightarrow \pi\pi, K\bar{K}, K\pi$
294 ±23		ASTON	88	LASS 0	$11 K^- p \rightarrow K^- \pi^+ n$
~ 200		BAUBILLIER	84B	HBC -	$8.25 K^- p \rightarrow \bar{K}^0 \pi^- p$
200 to 300		<sup>30</sup> ESTABROOKS	78	ASPK	$13 K^\pm p \rightarrow$ $K^\pm \pi^\pm (n, \Delta)$

<sup>17</sup> S-Matrix pole. Supersedes BUGG 06. Combined analysis of ASTON 88, ABLIKIM 06C, AITALA 06, and LINK 09 using an s-dependent width with couplings to  $K\pi$  and  $K\eta'$ , and the Adler zero near thresholds.

<sup>18</sup> From the isobar model with a complex pole for the  $\kappa$ .

<sup>19</sup> From a non-parametric analysis.

<sup>20</sup> A Breit-Wigner mass and width.

<sup>21</sup> S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C including the  $\kappa$  with an s-dependent width and an Adler zero near threshold.

<sup>22</sup> S-matrix pole. Using ASTON 88 and assuming  $K_0^*(800)$ ,  $K_0^*(1950)$ .

<sup>23</sup> Using ASTON 88 and assuming  $K_0^*(800)$ .

<sup>24</sup> T-matrix pole. Reanalysis of ASTON 88 data.

<sup>25</sup> Breit-Wigner fit. Using ASTON 88.

<sup>26</sup> Assuming a low-mass scalar  $K\pi$  resonance,  $\kappa(800)$ .

<sup>27</sup> T-matrix pole. Using data from ESTABROOKS 78 and ASTON 88.

<sup>28</sup>  $J^P$  not determined, could be  $K_2^*(1430)$ .

<sup>29</sup> T-matrix pole.

<sup>30</sup> From elastic  $K\pi$  partial-wave analysis.

**$K_0^*(1430)$  DECAY MODES**

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $K\pi$	$(93 \pm 10) \%$

 **$K_0^*(1430)$  BRANCHING RATIOS**

$\Gamma(K\pi)/\Gamma_{\text{total}}$					$\Gamma_1/\Gamma$
VALUE	DOCUMENT ID	TECN	CHG	COMMENT	
<b><math>0.93 \pm 0.04 \pm 0.09</math></b>	ASTON	88	LASS	0	11 $K^- p \rightarrow K^- \pi^+ n$

 **$K_0^*(1430)$  REFERENCES**

BUGG	10	PR D81 014002	D.V. Bugg	(LOQM)
LINK	09	PL B681 14	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
BONVICINI	08A	PR D78 052001	G. Bonvicini <i>et al.</i>	(CLEO Collab.)
LINK	07	PL B648 156	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
LINK	07B	PL B653 1	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
ABLIKIM	06C	PL B633 681	M. Ablikim <i>et al.</i>	(BES Collab.)
AITALA	06	PR D73 032004	E.M. Aitala <i>et al.</i>	(FNAL E791 Collab.)
Also		PR D74 059901 (errat.)	E.M. Aitala <i>et al.</i>	(FNAL E791 Collab.)
BUGG	06	PL B632 471	D.V. Bugg	(LOQM)
ZHOU	06	NP A775 212	Z.Y. Zhou, H.Q. Zheng	
ABLIKIM	05Q	PR D72 092002	M. Ablikim <i>et al.</i>	(BES Collab.)
ZHENG	04	NP A733 235	H.Q. Zheng <i>et al.</i>	
BUGG	03	PL B572 1	D.V. Bugg	
LI	03	PR D67 034025	L. Li, B. Zou, G. Li	
AITALA	02	PRL 89 121801	E.M. Aitala <i>et al.</i>	(FNAL E791 Collab.)
JAMIN	00	NP B587 331	M. Jamin <i>et al.</i>	
BARBERIS	98E	PL B436 204	D. Barberis <i>et al.</i>	(Omega Expt.)
ANISOVICH	97C	PL B413 137	A.V. Anisovich, A.V. Sarantsev	
TORNQVIST	96	PRL 76 1575	N.A. Tornqvist, M. Roos	(HELS)
ASTON	88	NP B296 493	D. Aston <i>et al.</i>	(SLAC, NAGO, CINC, INUS)
BAUBILLIER	84B	ZPHY C26 37	M. Baubillier <i>et al.</i>	(BIRM, CERN, GLAS+)
ESTABROOKS	78	NP B133 490	P.G. Estabrooks <i>et al.</i>	(MCGI, CARL, DURH+)
MARTIN	78	NP B134 392	A.D. Martin <i>et al.</i>	(DURH, GEVA)