

K₀^{*}(1430)

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

See our minireview in the 1994 edition and in this edition under the $f_0(500)$.

K₀^{*}(1430) MASS

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

¹ 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.

² From the isobar model with a complex pole for the κ .

³ From a non-parametric analysis.

⁴ A Breit-Wigner mass and width.

⁵ S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C including the κ with an s-dependent width and an Adler zero near threshold.

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

⁷ Using ASTON 88 and assuming $K_0^*(800)$.

⁸ T-matrix pole. Reanalysis of ASTON 88 data.

⁹ Breit-Wigner fit. Using ASTON 88.

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

¹¹ T-matrix pole. Using data from ESTABROOKS 78 and ASTON 88.

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

¹³ T-matrix pole.

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

¹⁵ Mass defined by pole position.

¹⁶ From elastic $K\pi$ partial-wave analysis.

$K_0^*(1430)$ WIDTH

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

¹⁷ 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.

¹⁸ From the isobar model with a complex pole for the κ .

¹⁹ From a non-parametric analysis.

²⁰ A Breit-Wigner mass and width.

²¹ S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C including the κ with an s -dependent width and an Adler zero near threshold.

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

²³ Using ASTON 88 and assuming $K_0^*(800)$.

²⁴ T-matrix pole. Reanalysis of ASTON 88 data.

²⁵ Breit-Wigner fit. Using ASTON 88.

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

²⁷ T-matrix pole. Using data from ESTABROOKS 78 and ASTON 88.

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

²⁹ T-matrix pole.

³⁰ From elastic $K\pi$ partial-wave analysis.

$K_0^*(1430)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $K\pi$	(93±10) %

$K_0^*(1430)$ BRANCHING RATIOS

$\Gamma(K\pi)/\Gamma_{\text{total}}$					Γ_1/Γ
VALUE	DOCUMENT ID	TECN	CHG	COMMENT	
0.93±0.04±0.09	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)