$K_0^*(800)$ or κ

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

OMITTED FROM SUMMARY TABLE

Needs confirmation. See the mini-review on scalar mesons under $f_0(600)$ (see the index for the page number).

$K_0^*(800)$ MASS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
676 ±40 OUR AVERAGE		Error includes scale factor of 2.9.		
$849 \pm 77 {}^{+18}_{-14}$	1421	[1,2] ABLIKIM 10E	BES2	$J/\psi \to K^\pm K^0_S \pi^\mp \pi^0$
$841 \pm 30 {}^{+81}_{-73}$	25k	[3,4] ABLIKIM 06C	BES2	$J/\psi \to \overline{K}^*(892)^0 K^+ \pi^-$
658 ± 13		[5] DESCOTES-G..06	RVUE	$\pi K \to \pi K$
$797 \pm 19 \pm 43$	15k	[6,7] AITALA 02	E791	$D^+ \to K^- \pi^+ \pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$663 \pm 8 \pm 34$		[8] BUGG 10	RVUE	S-matrix pole
$706.0 \pm 1.8 \pm 22.8$	141k	[9] BONVICINI 08A	CLEO	$D^+ \to K^- \pi^+ \pi^+$
$856 \pm 17 \pm 13$	54k	[10] LINK 07B	FOCS	$D^+ \to K^- \pi^+ \pi^+$
$750 {}^{+30}_{-55}$		[11] BUGG 06	RVUE	
855 ± 15	0.6k	[12] CAWLFIELD 06A	CLEO	$D^0 \to K^+ K^- \pi^0$
694 ± 53		[2,13] ZHOU 06	RVUE	$K p \to K^- \pi^+ n$
753 ± 52		[14] PELAEZ 04A	RVUE	$K\pi \to K\pi$
594 ± 79		[13] ZHENG 04	RVUE	$K^- p \to K^- \pi^+ n$
722 ± 60		[15] BUGG 03	RVUE	11 $K^- p \to K^- \pi^+ n$
$905 {}^{+65}_{-30}$		[16] ISHIDA 97B	RVUE	11 $K^- p \to K^- \pi^+ n$

[1] From a fit including ten additional resonances and energy-independent Breit-Wigner width.
[2] S-matrix pole.
[3] S-matrix pole. GUO 06 in a chiral unitary approach report a mass of 757 ± 33 MeV and a width of 558 ± 82 MeV.
[4] A fit in the $K_0^*(800) + K^*(892) + K^*(1410)$ model with mass and width of the $K_0^*(800)$ from ABLIKIM 06C well describes the left slope of the $K^0_S \pi^-$ invariant mass spectrum in $\tau^- \to K^0_S \pi^- \nu_\tau$ decay studied by EPIFANOV 07.
[5] S-matrix pole. Using Roy-Steiner equations (ROY 71) as well as unitarity, analyticity and crossing symmetry constraints.
[6] Not seen by KOPP 01 using 7070 events of $D^0 \to K^- \pi^+ \pi^0$. LINK 02E and LINK 05I show clear evidence for a constant non-resonant scalar amplitude rather than $K_0^*(800)$ in their high statistics analysis of $D^+ \to K^- \pi^+ \mu^+ \nu_\mu$.
[7] AUBERT 07T does not find evidence for the charged $K_0^*(800)$ using 11k events of $D^0 \to K^- K^+ \pi^0$.
[8] 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.
[9] T-matrix pole.

[10] A Breit-Wigner mass and width.
[11] S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C using for the κ an s-dependent width with an Adler zero near threshold.
[12] Breit-Wigner parameters. A significant S-wave can be also modeled as a non-resonant contribution.
[13] Using ASTON 88.
[14] T-matrix pole. Reanalysis of data from LINGLIN 73, ESTABROOKS 78, and ASTON 88 in the unitarized ChPT model.
[15] T-matrix pole. Reanalysis of ASTON 88 data.
[16] Reanalysis of ASTON 88 using interfering Breit-Wigner amplitudes.

$K_0^*(800)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
548 ± 24 OUR AVERAGE		Error includes scale factor of 1.1.			
512 ± 80 $^{+92}_{-44}$	1421	[17,18] ABLIKIM	10E	BES2	$J/\psi \to K^{\pm} K_S^0 \pi^{\mp} \pi^0$
618 ± 90 $^{+96}_{-144}$	25k	[17,19] ABLIKIM	06C	BES2	$J/\psi \to \overline{K}^*(892)^0 K^+ \pi^-$
557 ± 24		[20] DESCOTES-G..	06	RVUE	$\pi K \to \pi K$
410 ± 43 ± 87	15k	[21,22] AITALA	02	E791	$D^+ \to K^- \pi^+ \pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
658 ± 10 ± 44		[23] BUGG	10	RVUE	S-matrix pole
638.8 ± 4.4 ± 40.4	141k	[24] BONVICINI	08A	CLEO	$D^+ \to K^- \pi^+ \pi^+$
464 ± 28 ± 22	54k	[25] LINK	07B	FOCS	$D^+ \to K^- \pi^+ \pi^+$
684 ±120		[26] BUGG	06	RVUE	
251 ± 48	0.6k	[27] CAWLFIELD	06A	CLEO	$D^0 \to K^+ K^- \pi^0$
606 ± 59		[17,28] ZHOU	06	RVUE	$K p \to K^- \pi^+ n$
470 ± 66		[29] PELAEZ	04A	RVUE	$K\pi \to K\pi$
724 ±332		[28] ZHENG	04	RVUE	$K^- p \to K^- \pi^+ n$
772 ±100		[30] BUGG	03	RVUE	11 $K^- p \to K^- \pi^+ n$
545 $^{+235}_{-110}$		[31] ISHIDA	97B	RVUE	11 $K^- p \to K^- \pi^+ n$

[17] S-matrix pole.
[18] From a fit including ten additional resonances and energy-independent Breit-Wigner width.
[19] A fit in the $K_0^*(800) + K^*(892) + K^*(1410)$ model with mass and width of the $K_0^*(800)$ from ABLIKIM 06C well describes the left slope of the $K_S^0 \pi^-$ invariant mass spectrum in $\tau^- \to K_S^0 \pi^- \nu_\tau$ decay studied by EPIFANOV 07.
[20] S-matrix pole. Using Roy-Steiner equations (ROY 71) as well as unitarity, analyticity and crossing symmetry constraints.
[21] Not seen by KOPP 01 using 7070 events of $D^0 \to K^- \pi^+ \pi^0$. LINK 02E and LINK 05I show clear evidence for a constant non-resonant scalar amplitude rather than $K_0^*(800)$ in their high statistics analysis of $D^+ \to K^- \pi^+ \mu^+ \nu_\mu$.
[22] AUBERT 07T does not find evidence for the charged $K_0^*(800)$ using 11k events of $D^0 \to K^- K^+ \pi^0$.
[23] 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.
[24] T-matrix pole.
[25] A Breit-Wigner mass and width.

[26] S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C using for the κ an s-dependent width with an Adler zero near threshold.

[27] Statistical error only. A fit to the Dalitz plot including the $K^*_0(800)^\pm$, $K^*(892)^\pm$, and ϕ resonances modeled as Breit-Wigners. A significant S-wave can be also modeled as a non-resonant contribution.

[28] Using ASTON 88.

[29] T-matrix pole. Reanalysis of data from LINGLIN 73, ESTABROOKS 78, and ASTON 88 in the unitarized ChPT model.

[30] T-matrix pole. Reanalysis of ASTON 88 data.

[31] Reanalysis of ASTON 88 using interfering Breit-Wigner amplitudes.

$K^*_0(800)$ REFERENCES

ABLIKIM	10E	PL B693 88	M. Ablikim *et al.*	(BES II Collab.)
BUGG	10	PR D81 014002	D.V. Bugg	(LOQM)
LINK	09	PL B681 14	J.M. Link *et al.*	(FNAL FOCUS Collab.)
BONVICINI	08A	PR D78 052001	G. Bonvicini *et al.*	(CLEO Collab.)
AUBERT	07T	PR D76 011102R	B. Aubert *et al.*	(BABAR Collab.)
EPIFANOV	07	PL B654 65	D. Epifanov *et al.*	(BELLE Collab.)
LINK	07B	PL B653 1	J.M. Link *et al.*	(FNAL FOCUS Collab.)
ABLIKIM	06C	PL B633 681	M. Ablikim *et al.*	(BES Collab.)
AITALA	06	PR D73 032004	E.M. Aitala *et al.*	(FNAL E791 Collab.)
Also		PR D74 059901 (errat.)	E.M. Aitala *et al.*	(FNAL E791 Collab.)
BUGG	06	PL B632 471	D.V. Bugg	(LOQM)
CAWLFIELD	06A	PR D74 031108R	C. Cawlfield *et al.*	(CLEO Collab.)
DESCOTES-G...	06	EPJ C48 553	S. Descotes-Genon, B. Moussallam	
GUO	06	NP A773 78	F.K. Guo *et al.*	
ZHOU	06	NP A775 212	Z.Y. Zhou, H.Q. Zheng	
LINK	05I	PL B621 72	J.M. Link *et al.*	(FNAL FOCUS Collab.)
PELAEZ	04A	MPL A19 2879	J.R. Pelaez	
ZHENG	04	NP A733 235	H.Q. Zheng *et al.*	
BUGG	03	PL B572 1	D.V. Bugg	
AITALA	02	PRL 89 121801	E.M. Aitala *et al.*	(FNAL E791 Collab.)
LINK	02E	PL B535 43	J.M. Link *et al.*	(FNAL FOCUS Collab.)
KOPP	01	PR D63 092001	S. Kopp *et al.*	(CLEO Collab.)
ISHIDA	97B	PTP 98 621	S. Ishida *et al.*	
ASTON	88	NP B296 493	D. Aston *et al.*	(SLAC, NAGO, CINC, INUS)
ESTABROOKS	78	NP B133 490	P.G. Estabrooks *et al.*	(MCGI, CARL, DURH+)
LINGLIN	73	NP B55 408	D. Linglin	(CERN)
ROY	71	PL 36B 353	S.M. Roy	