$K_0^*(800)$ 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
672 ±40 OUR AVERAGE Error includes scale factor of 2.9.					
841 ±30 $^{+81}_{-73}$	25k	[1,2] ABLIKIM	06C	BES2	$J/\psi \to \overline{K}^*(892)^0 K^+ \pi^-$
658 ±13		[3] DESCOTES-G..06		RVUE	$\pi K \to \pi K$
797 ±19 ±43	15090	[4,5] AITALA	02	E791	$D^+ \to K^- \pi^+ \pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
663 ± 8 ±34		[6] BUGG	10	RVUE	S-matrix pole
706.0± 1.8±22.8	141k	[7] BONVICINI	08A	CLEO	$D^+ \to K^- \pi^+ \pi^+$
856 ±17 ±13	54k	[8] LINK	07B	FOCS	$D^+ \to K^- \pi^+ \pi^+$
750 $^{+30}_{-55}$		[9] BUGG	06	RVUE	
855 ±15	627 ± 30	[10] CAWLFIELD	06A	CLEO	$D^0 \to K^+ K^- \pi^0$
694 ±53		[11,12] ZHOU	06	RVUE	$K p \to K^- \pi^+ n$
753 ±52		[13] PELAEZ	04A	RVUE	$K\pi \to K\pi$
594 ±79		[12] ZHENG	04	RVUE	$K^- p \to K^- \pi^+ n$
722 ±60		[14] BUGG	03	RVUE	11 $K^- p \to K^- \pi^+ n$
905 $^{+65}_{-30}$		[15] ISHIDA	97B	RVUE	11 $K^- p \to K^- \pi^+ n$

[1] S-matrix pole. GUO 06 in a chiral unitary approach report a mass of 757 ± 33 MeV and a width of 558 ± 82 MeV.

[2] 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.

[3] S-matrix pole. Using Roy-Steiner equations (ROY 71) as well as unitarity, analyticity and crossing symmetry constraints.

[4] 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 $D^+ \to K^- \pi^+ \mu^+ \nu_\mu$.

[5] AUBERT 07T does not find evidence for the charged $K_0^*(800)$ using 11k events of $D^0 \to K^- K^+ \pi^0$.

[6] 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.

[7] T-matrix pole.

[8] A Breit-Wigner mass and width.

[9] 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.

[10] Breit-Wigner parameters. A significant S-wave can be also modeled as a non-resonant contribution.
[11] S-matrix pole.
[12] Using ASTON 88.
[13] T-matrix pole. Reanalysis of data from LINGLIN 73, ESTABROOKS 78, and ASTON 88 in the unitarized ChPT model.
[14] T-matrix pole. Reanalysis of ASTON 88 data.
[15] Reanalysis of ASTON 88 using interfering Breit-Wigner amplitudes.

$K_0^*(800)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
550 ± 34 OUR AVERAGE		Error includes scale factor of 1.5.		
$618 \pm 90 {}^{+96}_{-144}$	25k	[16,17] ABLIKIM	06C BES2	$J/\psi \to \overline{K}^*(892)^0 K^+ \pi^-$
557 ± 24		[18] DESCOTES-G..06	RVUE	$\pi K \to \pi K$
$410 \pm 43 \pm 87$	15k	[19,20] AITALA	02 E791	$D^+ \to K^- \pi^+ \pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$658 \pm 10 \pm 44$		[21] BUGG	10 RVUE	S-matrix pole
$638.8 \pm 4.4 \pm 40.4$	141k	[22] BONVICINI	08A CLEO	$D^+ \to K^- \pi^+ \pi^+$
$464 \pm 28 \pm 22$	54k	[23] LINK	07B FOCS	$D^+ \to K^- \pi^+ \pi^+$
684 ± 120		[24] BUGG	06 RVUE	
251 ± 48	0.6k	[25] CAWLFIELD	06A CLEO	$D^0 \to K^+ K^- \pi^0$
606 ± 59		[16,26] ZHOU	06 RVUE	$K p \to K^- \pi^+ n$
470 ± 66		[27] PELAEZ	04A RVUE	$K\pi \to K\pi$
724 ± 332		[26] ZHENG	04 RVUE	$K^- p \to K^- \pi^+ n$
772 ± 100		[28] BUGG	03 RVUE	11 $K^- p \to K^- \pi^+ n$
$545 {}^{+235}_{-110}$		[29] ISHIDA	97B RVUE	11 $K^- p \to K^- \pi^+ n$

[16] S-matrix pole.
[17] 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.
[18] S-matrix pole. Using Roy-Steiner equations (ROY 71) as well as unitarity, analyticity and crossing symmetry constraints.
[19] 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 $D^+ \to K^- \pi^+ \mu^+ \nu_\mu$.
[20] AUBERT 07T does not find evidence for the charged $K_0^*(800)$ using 11k events of $D^0 \to K^- K^+ \pi^0$.
[21] 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.
[22] T-matrix pole.
[23] A Breit-Wigner mass and width.
[24] 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.
[25] 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.

[26] Using ASTON 88.
[27] T-matrix pole. Reanalysis of data from LINGLIN 73, ESTABROOKS 78, and ASTON 88 in the unitarized ChPT model.
[28] T-matrix pole. Reanalysis of ASTON 88 data.
[29] Reanalysis of ASTON 88 using interfering Breit-Wigner amplitudes.

$K_0^*(800)$ REFERENCES

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	