

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

## OMITTED FROM SUMMARY TABLE

Needs confirmation. See the mini-review on scalar mesons under  $f_0(500)$  (see the index for the page number).

 **$K_0^*(800)$  MASS**

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>682 ± 29</b>	<b>OUR AVERAGE</b>	Error includes scale factor of 2.4. See the ideogram below.		
826 ± 49	$^{+49}_{-34}$	1338	<sup>1</sup> ABLIKIM 11B BES2	$J/\psi \rightarrow K_S^0 K_S^0 \pi^+ \pi^-$
849 ± 77	$^{+18}_{-14}$	1421	<sup>2,3</sup> ABLIKIM 10E BES2	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp \pi^0$
841 ± 30	$^{+81}_{-73}$	25k	<sup>4,5</sup> ABLIKIM 06C BES2	$J/\psi \rightarrow \bar{K}^*(892)^0 K^+ \pi^-$
658 ± 13			<sup>6</sup> DESCOTES-G..06 RVUE	$\pi K \rightarrow \pi K$
797 ± 19	± 43	15k	<sup>7,8</sup> AITALA 02 E791	$D^+ \rightarrow K^- \pi^+ \pi^+$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
663 ± 8	± 34		<sup>9</sup> BUGG 10 RVUE	S-matrix pole
706.0 ± 1.8	± 22.8	141k	<sup>10</sup> BONVICINI 08A CLEO	$D^+ \rightarrow K^- \pi^+ \pi^+$
856 ± 17	± 13	54k	<sup>11</sup> LINK 07B FOCS	$D^+ \rightarrow K^- \pi^+ \pi^+$
750	$^{+30}_{-55}$		<sup>12</sup> BUGG 06 RVUE	
855 ± 15		0.6k	<sup>13</sup> CAWLFIELD 06A CLEO	$D^0 \rightarrow K^+ K^- \pi^0$
694 ± 53			<sup>3,14</sup> ZHOU 06 RVUE	$K p \rightarrow K^- \pi^+ n$
753 ± 52			<sup>15</sup> PELAEZ 04A RVUE	$K \pi \rightarrow K \pi$
594 ± 79			<sup>14</sup> ZHENG 04 RVUE	$K^- p \rightarrow K^- \pi^+ n$
722 ± 60			<sup>16</sup> BUGG 03 RVUE	$11 K^- p \rightarrow K^- \pi^+ n$
905	$^{+65}_{-30}$		<sup>17</sup> ISHIDA 97B RVUE	$11 K^- p \rightarrow K^- \pi^+ n$

<sup>1</sup> The Breit-Wigner parameters from a fit with seven intermediate resonances. The S-matrix pole position is  $(764 \pm 63^{+71}_{-54}) - i(306 \pm 149^{+143}_{-85})$  MeV.

<sup>2</sup> From a fit including ten additional resonances and energy-independent Breit-Wigner width.

<sup>3</sup> S-matrix pole.

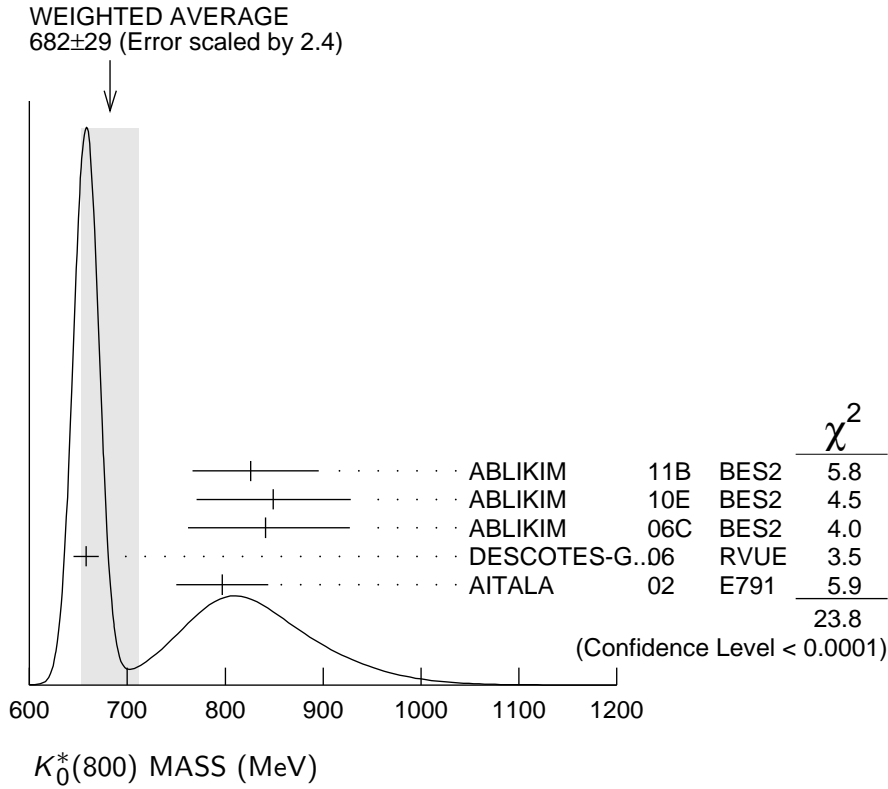
<sup>4</sup> S-matrix pole. GUO 06 in a chiral unitary approach report a mass of  $757 \pm 33$  MeV and a width of  $558 \pm 82$  MeV.

<sup>5</sup> 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  $\tau^- \rightarrow K_S^0 \pi^- \nu_\tau$  decay studied by EPIFANOV 07.

<sup>6</sup> S-matrix pole. Using Roy-Steiner equations (ROY 71) as well as unitarity, analyticity and crossing symmetry constraints.

<sup>7</sup> Not seen by KOPP 01 using 7070 events of  $D^0 \rightarrow K^- \pi^+ \pi^0$ . 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  $D^+ \rightarrow K^- \pi^+ \mu^+ \nu_\mu$ .

- 8 AUBERT 07T does not find evidence for the charged  $K_0^*(800)$  using 11k events of  $D^0 \rightarrow K^- K^+ \pi^0$ .
- 9 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.
- 10 T-matrix pole.
- 11 A Breit-Wigner mass and width.
- 12 S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C using for the  $\kappa$  an  $s$ -dependent width with an Adler zero near threshold.
- 13 Breit-Wigner parameters. A significant  $S$ -wave can be also modeled as a non-resonant contribution.
- 14 Using ASTON 88.
- 15 T-matrix pole. Reanalysis of data from LINGLIN 73, ESTABROOKS 78, and ASTON 88 in the unitarized ChPT model.
- 16 T-matrix pole. Reanalysis of ASTON 88 data.
- 17 Reanalysis of ASTON 88 using interfering Breit-Wigner amplitudes.



### $K_0^*(800)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b>547 ± 24</b>	<b>OUR AVERAGE</b>	Error includes scale factor of 1.1.		
449 ± 156 +144 - 81	1338	18 ABLIKIM	11B BES2	$J/\psi \rightarrow K_S^0 K_S^0 \pi^+ \pi^-$
512 ± 80 + 92 - 44	1421	19,20 ABLIKIM	10E BES2	$J/\psi \rightarrow K^\pm K_S^0 \pi^\mp \pi^0$
618 ± 90 + 96 -144	25k	19,21 ABLIKIM	06C BES2	$J/\psi \rightarrow \bar{K}^*(892)^0 K^+ \pi^-$
557 ± 24		22 DESCOTES-G..06	RVUE	$\pi K \rightarrow \pi K$
410 ± 43 ± 87	15k	23,24 AITALA	02 E791	$D^+ \rightarrow K^- \pi^+ \pi^+$

• • • We do not use the following data for averages, fits, limits, etc. • • •

658 ± 10 ± 44	25	BUGG	10	RVUE	S-matrix pole
638.8 ± 4.4 ± 40.4 141k	26	BONVICINI	08A	CLEO	$D^+ \rightarrow K^- \pi^+ \pi^+$
464 ± 28 ± 22 54k	27	LINK	07B	FOCS	$D^+ \rightarrow K^- \pi^+ \pi^+$
684 ± 120	28	BUGG	06	RVUE	
251 ± 48 0.6k	29	CAWLFIELD	06A	CLEO	$D^0 \rightarrow K^+ K^- \pi^0$
606 ± 59	19,30	ZHOU	06	RVUE	$K p \rightarrow K^- \pi^+ n$
470 ± 66	31	PELAEZ	04A	RVUE	$K \pi \rightarrow K \pi$
724 ± 332	30	ZHENG	04	RVUE	$K^- p \rightarrow K^- \pi^+ n$
772 ± 100	32	BUGG	03	RVUE	$11 K^- p \rightarrow K^- \pi^+ n$
545 +235 -110	33	ISHIDA	97B	RVUE	$11 K^- p \rightarrow K^- \pi^+ n$

<sup>18</sup> The Breit-Wigner parameters from a fit with seven intermediate resonances. The S-matrix pole position is  $(764 \pm 63_{-54}^{+71}) - i(306 \pm 149_{-85}^{+143})$  MeV.

<sup>19</sup> S-matrix pole.

<sup>20</sup> From a fit including ten additional resonances and energy-independent Breit-Wigner width.

<sup>21</sup> 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  $\tau^- \rightarrow K_S^0 \pi^- \nu_\tau$  decay studied by EPIFANOV 07.

<sup>22</sup> S-matrix pole. Using Roy-Steiner equations (ROY 71) as well as unitarity, analyticity and crossing symmetry constraints.

<sup>23</sup> Not seen by KOPP 01 using 7070 events of  $D^0 \rightarrow K^- \pi^+ \pi^0$ . 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  $D^+ \rightarrow K^- \pi^+ \mu^+ \nu_\mu$ .

<sup>24</sup> AUBERT 07T does not find evidence for the charged  $K_0^*(800)$  using 11k events of  $D^0 \rightarrow K^- K^+ \pi^0$ .

<sup>25</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>26</sup> T-matrix pole.

<sup>27</sup> A Breit-Wigner mass and width.

<sup>28</sup> S-matrix pole. Reanalysis of ASTON 88, AITALA 02, and ABLIKIM 06C using for the  $\kappa$  an s-dependent width with an Adler zero near threshold.

<sup>29</sup> Statistical error only. A fit to the Dalitz plot including the  $K_0^*(800)^\pm$ ,  $K^*(892)^\pm$ , and  $\phi$  resonances modeled as Breit-Wigners. A significant S-wave can be also modeled as a non-resonant contribution.

<sup>30</sup> Using ASTON 88.

<sup>31</sup> T-matrix pole. Reanalysis of data from LINGLIN 73, ESTABROOKS 78, and ASTON 88 in the unitarized ChPT model.

<sup>32</sup> T-matrix pole. Reanalysis of ASTON 88 data.

<sup>33</sup> Reanalysis of ASTON 88 using interfering Breit-Wigner amplitudes.

**$K_0^*(800)$  REFERENCES**

ABLIKIM	11B	PL B698 183	M. Ablikim <i>et al.</i>	(BES II Collab.)
ABLIKIM	10E	PL B693 88	M. Ablikim <i>et al.</i>	(BES II Collab.)
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.)
AUBERT	07T	PR D76 011102	B. Aubert <i>et al.</i>	(BABAR Collab.)
EPIFANOV	07	PL B654 65	D. Epifanov <i>et al.</i>	(BELLE 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)
CAWLFIELD	06A	PR D74 031108	C. Cawfield <i>et al.</i>	(CLEO Collab.)
DESCOTES-G...	06	EPJ C48 553	S. Descotes-Genon, B. Moussallam	
GUO	06	NP A773 78	F.K. Guo <i>et al.</i>	
ZHOU	06	NP A775 212	Z.Y. Zhou, H.Q. Zheng	
LINK	05I	PL B621 72	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
PELAEZ	04A	MPL A19 2879	J.R. Pelaez	
ZHENG	04	NP A733 235	H.Q. Zheng <i>et al.</i>	
BUGG	03	PL B572 1	D.V. Bugg	
AITALA	02	PRL 89 121801	E.M. Aitala <i>et al.</i>	(FNAL E791 Collab.)
LINK	02E	PL B535 43	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
KOPP	01	PR D63 092001	S. Kopp <i>et al.</i>	(CLEO Collab.)
ISHIDA	97B	PTP 98 621	S. Ishida <i>et al.</i>	
ASTON	88	NP B296 493	D. Aston <i>et al.</i>	(SLAC, NAGO, CINC, INUS)
ESTABROOKS	78	NP B133 490	P.G. Estabrooks <i>et al.</i>	(MCGI, CARL, DURH+)
LINGLIN	73	NP B55 408	D. Linglin	(CERN)
ROY	71	PL 36B 353	S.M. Roy	