

K₁(1270)

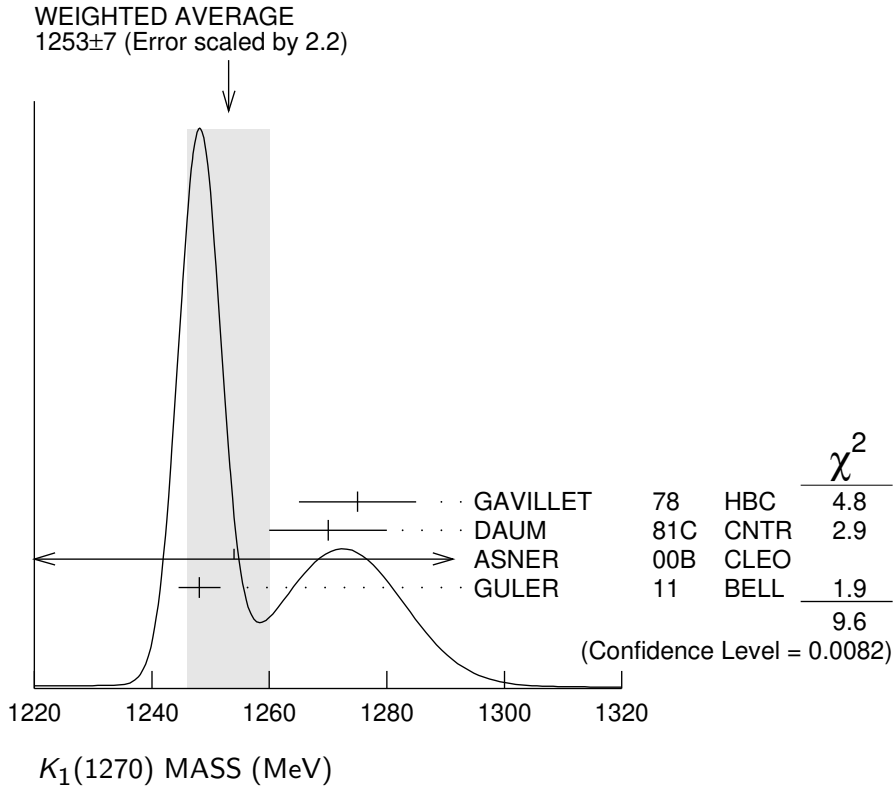
$$I(J^P) = \frac{1}{2}(1^+)$$

K₁(1270) MASS

VALUE (MeV)

DOCUMENT ID

1253±7 OUR AVERAGE Includes data from the 4 datablocks that follow this one. Error includes scale factor of 2.2. See the ideogram below.



PRODUCED BY K⁻, BACKWARD SCATTERING, HYPERON EXCHANGE

VALUE (MeV) EVTS DOCUMENT ID TECN CHG COMMENT

The data in this block is included in the average printed for a previous datablock.

1275±10 700 GAVILLET 78 HBC + 4.2 K⁻ p → Ξ⁻ (K π π)⁺

PRODUCED BY K BEAMS

VALUE (MeV) DOCUMENT ID TECN CHG COMMENT

The data in this block is included in the average printed for a previous datablock.

1270±10 ¹ DAUM 81C CNTR - 63 K⁻ p → K⁻ 2π p

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

~ 1276	² TORNQVIST	82B	RVUE		
~ 1300	VERGEEST	79	HBC	-	4.2 $K^- p \rightarrow (\bar{K}\pi\pi)^- p$
1289±25	³ CARNEGIE	77	ASPK	±	13 $K^\pm p \rightarrow (K\pi\pi)^\pm p$
~ 1300	BRANDENB...	76	ASPK	±	13 $K^\pm p \rightarrow (K\pi\pi)^\pm p$
~ 1270	OTTER	76	HBC	-	10,14,16 $K^- p \rightarrow (\bar{K}\pi\pi)^- p$
1260	DAVIS	72	HBC	+	12 $K^+ p$
1234±12	FIRESTONE	72B	DBC	+	12 $K^+ d$

¹ Well described in the chiral unitary approach of GENG 07 with two poles at 1195 and 1284 MeV and widths of 246 and 146 MeV, respectively.

² From a unitarized quark-model calculation.

³ From a model-dependent fit with Gaussian background to BRANDENBURG 76 data.

PRODUCED BY BEAMS OTHER THAN K MESONS

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
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The data in this block is included in the average printed for a previous datablock.

1248.1 ± 3.3 ± 1.4	GULER	11	BELL	$B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1289.81± 0.56±1.66	894k	AAIJ	18A1	LHCB	$D^0 \rightarrow K^\mp \pi^\pm \pi^\pm \pi^\mp$
1279 ± 10	25k	¹ ABLIKIM	06C	BES2	$J/\psi \rightarrow \bar{K}^*(892)^0 K^+ \pi^-$
1294 ± 10	310	RODEBACK	81	HBC	$4 \pi^- p \rightarrow \Lambda K 2\pi$
1300	40	CRENNELL	72	HBC	$4.5 \pi^- p \rightarrow \Lambda K 2\pi$
1242 + ⁹ / ₋₁₀		² ASTIER	69	HBC	$\bar{p} p$
1300	45	CRENNELL	67	HBC	$6 \pi^- p \rightarrow \Lambda K 2\pi$

¹ Systematic errors not estimated.

² This was called the C meson.

PRODUCED IN τ LEPTON DECAYS

<u>VALUE (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>CHG</u>	<u>COMMENT</u>
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The data in this block is included in the average printed for a previous datablock.

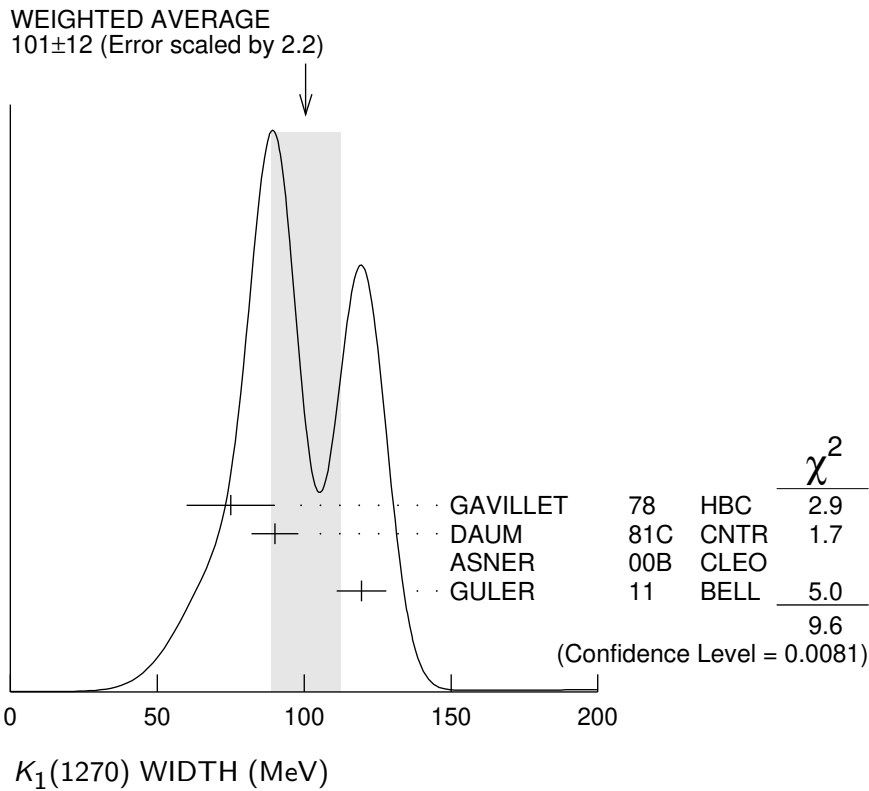
1254±33±34	7k	ASNER	00B	CLEO	± $\tau^- \rightarrow K^- \pi^+ \pi^- \nu_\tau$
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$K_1(1270)$ WIDTH

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>
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90±20 OUR ESTIMATE This is only an educated guess; the error given is larger than the error on the average of the published values.

101±12 OUR AVERAGE Includes data from the 4 datablocks that follow this one. Error includes scale factor of 2.2. See the ideogram below.



PRODUCED BY K^- , BACKWARD SCATTERING, HYPERON EXCHANGE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
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The data in this block is included in the average printed for a previous datablock.

75±15	700	GAVILLET	78	HBC	+ 4.2 $K^- p \rightarrow \Xi^- K \pi \pi$
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PRODUCED BY K BEAMS

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
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The data in this block is included in the average printed for a previous datablock.

90± 8	¹ DAUM	81C	CNTR	- 63 $K^- p \rightarrow K^- 2\pi p$	
• • •	We do not use the following data for averages, fits, limits, etc. • • •				
~ 150	VERGEEST	79	HBC	- 4.2 $K^- p \rightarrow (\bar{K} \pi \pi)^- p$	
150±71	² CARNEGIE	77	ASPK	± 13 $K^\pm p \rightarrow (K \pi \pi)^\pm p$	
~ 200	BRANDENB...	76	ASPK	± 13 $K^\pm p \rightarrow (K \pi \pi)^\pm p$	
120	DAVIS	72	HBC	+ 12 $K^+ p$	
188±21	FIRESTONE	72B	DBC	+ 12 $K^+ d$	

¹ Well described in the chiral unitary approach of GENG 07 with two poles at 1195 and 1284 MeV and widths of 246 and 146 MeV, respectively.

² From a model-dependent fit with Gaussian background to BRANDENBURG 76 data.

PRODUCED BY BEAMS OTHER THAN K MESONS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
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The data in this block is included in the average printed for a previous datablock.

119.5 ± 5.2 ± 6.7	GULER	11	BELL	$B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$
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• • • We do not use the following data for averages, fits, limits, etc. • • •

116.11 ± 1.65 ± 2.96	894k	AAIJ	18A1	LHCB	$D^0 \rightarrow K^{\mp} \pi^{\pm} \pi^{\pm} \pi^{\mp}$
131 ± 21	25k	¹ ABLIKIM	06C	BES2	$J/\psi \rightarrow \bar{K}^*(892)^0 K^+ \pi^-$
66 ± 15	310	RODEBACK	81	HBC	$4 \pi^- p \rightarrow \Lambda K 2\pi$
60	40	CRENNELL	72	HBC	$4.5 \pi^- p \rightarrow \Lambda K 2\pi$
127 ⁺⁷ / ₋₂₅		ASTIER	69	HBC	$\bar{p} p$
60	45	CRENNELL	67	HBC	$6 \pi^- p \rightarrow \Lambda K 2\pi$

¹ Systematic errors not estimated.

PRODUCED IN τ LEPTON DECAYS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
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The data in this block is included in the average printed for a previous datablock.

$260^{+90}_{-70} \pm 80$	7k	ASNER	00B	CLEO	$\tau^- \rightarrow K^- \pi^+ \pi^- \nu_{\tau}$
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$K_1(1270)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)	Scale factor
Γ_1 $K\rho$	(38 ± 13) %	2.2
Γ_2 $K_0^*(1430)\pi$	(28 ± 4) %	
Γ_3 $K^*(892)\pi$	(21 ± 10) %	2.2
Γ_4 $K\omega$	(11.0 ± 2.0) %	
Γ_5 $K f_0(1370)$	(3.0 ± 2.0) %	
Γ_6 γK^0	seen	

$K_1(1270)$ PARTIAL WIDTHS

$\Gamma(K\rho)$ Γ_1

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

57 ± 5	MAZZUCATO 79	HBC	+	4.2 $K^- p \rightarrow \Xi^- (K\pi\pi)^+$
75 ± 6	CARNEGIE 77B	ASPK	±	13 $K^{\pm} p \rightarrow (K\pi\pi)^{\pm} p$

$\Gamma(K_0^*(1430)\pi)$ Γ_2

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

26 ± 6	CARNEGIE 77B	ASPK	±	13 $K^{\pm} p \rightarrow (K\pi\pi)^{\pm} p$
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$\Gamma(K^*(892)\pi)$ Γ_3

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

14 ± 11	MAZZUCATO 79	HBC	+	4.2 $K^- p \rightarrow \Xi^- (K\pi\pi)^+$
2 ± 2	CARNEGIE 77B	ASPK	±	13 $K^{\pm} p \rightarrow (K\pi\pi)^{\pm} p$

$\Gamma(K\omega)$ Γ_4

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
4 ± 4	MAZZUCATO 79	HBC	+	$4.2 K^- p \rightarrow \Xi^- (K\pi\pi)^+$
24 ± 3	CARNEGIE 77B	ASPK	\pm	$13 K^\pm p \rightarrow (K\pi\pi)^\pm p$

$\Gamma(K f_0(1370))$ Γ_5

VALUE (MeV)	DOCUMENT ID	TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
22 ± 5	CARNEGIE 77B	ASPK	\pm	$13 K^\pm p \rightarrow (K\pi\pi)^\pm p$

$\Gamma(\gamma K^0)$ Γ_6

VALUE (keV)	DOCUMENT ID	TECN	COMMENT
$73.2 \pm 6.1 \pm 28.3$	ALAVI-HARATI02B	KTEV	$K + A \rightarrow K^* + A$

$K_1(1270)$ BRANCHING RATIOS

$\Gamma(K\rho)/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.38 ± 0.13 OUR FIT			Error includes scale factor of 2.2.
0.42 ± 0.06	¹ DAUM	81C	CNTR 63 $K^- p \rightarrow K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.584 ± 0.043	² GULER	11	BELL $B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$
dominant	RODEBACK	81	HBC $4 \pi^- p \rightarrow \Lambda K 2\pi$

$\Gamma(K_0^*(1430)\pi)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.28 ± 0.04	¹ DAUM	81C	CNTR 63 $K^- p \rightarrow K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.0201 ± 0.0064	² GULER	11	BELL $B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$

$\Gamma(K^*(892)\pi)/\Gamma_{\text{total}}$ Γ_3/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.21 ± 0.10 OUR FIT			Error includes scale factor of 2.2.
0.16 ± 0.05	¹ DAUM	81C	CNTR 63 $K^- p \rightarrow K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.171 ± 0.023	² GULER	11	BELL $B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$

$\Gamma(K^*(892)\pi)/\Gamma(K\rho)$ Γ_3/Γ_1

VALUE	DOCUMENT ID	TECN	COMMENT
0.56 ± 0.29 OUR FIT			Error includes scale factor of 2.2.
$0.99 \pm 0.15 \pm 0.18$	ABLIKIM	21U	BES3 $D_s^+ \rightarrow \bar{K}_1(1270)^0 K^+$

$\Gamma(K\omega)/\Gamma_{\text{total}}$ Γ_4/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
0.11 ± 0.02	¹ DAUM	81C	CNTR 63 $K^- p \rightarrow K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.225 ± 0.052	² GULER	11	BELL $B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$

$\Gamma(K\omega)/\Gamma(K\rho)$

Γ_4/Γ_1

VALUE CL% DOCUMENT ID TECN COMMENT

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

<0.30 95 RODEBACK 81 HBC $4 \pi^- p \rightarrow \Lambda K 2\pi$

$\Gamma(K f_0(1370))/\Gamma_{total}$

Γ_5/Γ

VALUE DOCUMENT ID TECN COMMENT

0.03±0.02 ¹ DAUM 81C CNTR 63 $K^- p \rightarrow K^- 2\pi p$

D-wave/S-wave RATIO FOR $K_1(1270) \rightarrow K^*(892)\pi$

VALUE DOCUMENT ID TECN COMMENT

1.0±0.7 ¹ DAUM 81C CNTR 63 $K^- p \rightarrow K^- 2\pi p$

¹ Average from low and high *t* data.

² Assuming that decays are saturated by the $K\rho$, $K_0^*(1430)\pi$, $K^*(892)\pi$, $K\omega$ decay modes and neglecting interference between them. The values $B(\omega \rightarrow \pi^+\pi^-) = (1.53^{+0.11}_{-0.13})\%$ and $B(K_0^*(1430) \rightarrow K\pi) = (93 \pm 10)\%$ are used. Systematic uncertainties not estimated.

$K_1(1270)$ REFERENCES

ABLIKIM	21U	PR D104 032011	M. Ablikim <i>et al.</i>	(BESIII Collab.)
AAIJ	18AI	EPJ C78 443	R. Aaij <i>et al.</i>	(LHCb Collab.)
GULER	11	PR D83 032005	H. Guler <i>et al.</i>	(BELLE Collab.)
GENG	07	PR D75 014017	L.S. Geng <i>et al.</i>	
ABLIKIM	06C	PL B633 681	M. Ablikim <i>et al.</i>	(BES Collab.)
ALAVI-HARATI	02B	PRL 89 072001	A. Alavi-Harati <i>et al.</i>	(FNAL KTeV Collab.)
ASNER	00B	PR D62 072006	D.M. Asner <i>et al.</i>	(CLEO Collab.)
TORNQVIST	82B	NP B203 268	N.A. Tornqvist	(HELS)
DAUM	81C	NP B187 1	C. Daum <i>et al.</i>	(AMST, CERN, CRAC, MPIM+)
RODEBACK	81	ZPHY C9 9	S. Rodeback <i>et al.</i>	(CERN, CDEF, MADR+)
MAZZUCATO	79	NP B156 532	M. Mazzucato <i>et al.</i>	(CERN, ZEEM, NIJM+)
VERGEEST	79	NP B158 265	J.S.M. Vergeest <i>et al.</i>	(NIJM, AMST, CERN+)
GAVILLET	78	PL 76B 517	P. Gavillet <i>et al.</i>	(AMST, CERN, NIJM+) JP
CARNEGIE	77	NP B127 509	R.K. Carnegie <i>et al.</i>	(SLAC)
CARNEGIE	77B	PL 68B 287	R.K. Carnegie <i>et al.</i>	(SLAC)
BRANDENB...	76	PRL 36 703	G.W. Brandenburg <i>et al.</i>	(SLAC) JP
OTTER	76	NP B106 77	G. Otter <i>et al.</i>	(AACH3, BERL, CERN, LOIC+) JP
CRENNELL	72	PR D6 1220	D.J. Crennell <i>et al.</i>	(BNL)
DAVIS	72	PR D5 2688	P.J. Davis <i>et al.</i>	(LBL)
FIRESTONE	72B	PR D5 505	A. Firestone <i>et al.</i>	(LBL)
ASTIER	69	NP B10 65	A. Astier <i>et al.</i>	(CDEF, CERN, IPNP, LIVP) IJP
CRENNELL	67	PRL 19 44	D.J. Crennell <i>et al.</i>	(BNL) I