$K_1(1270)$

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

$K_1(1270)$ MASS

VALUE (MeV)	DOCUMENT ID
1272±7 OUR AVERAGE	Includes data from the 2 datablocks that follow this one.

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 $K^- p \rightarrow \Xi^- (K\pi\pi)^+$

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 $K^- p \rightarrow K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
∼ 1276	[2] TORNQVIST	82B	RVUE		
∼ 1300	VERGEEST	79	HBC	−	4.2 $K^- p \rightarrow (\overline{K}\pi\pi)^- p$
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 $K^- p \rightarrow (\overline{K}\pi\pi)^- p$
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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1248.1± 3.3±1.4		GULER	11	BELL		$B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1279 ±10	25k	[4] ABLIKIM	06C	BES2		$J/\psi \rightarrow \overline{K}^*(892)^0 K^+ \pi^-$
1294 ±10	310	RODEBACK	81	HBC		4 $\pi^- p \rightarrow \Lambda K 2\pi$
1300	40	CRENNELL	72	HBC	0	4.5 $\pi^- p \rightarrow \Lambda K 2\pi$
1242 $^{+9}_{-10}$		[5] ASTIER	69	HBC	0	$\overline{p} p$
1300	45	CRENNELL	67	HBC	0	6 $\pi^- p \rightarrow \Lambda K 2\pi$

[4] Systematic errors not estimated.
[5] This was called the C meson.

PRODUCED IN τ LEPTON DECAYS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1254±33±34	7k	ASNER	00B	CLEO	±	$\tau^- \rightarrow K^- \pi^+ \pi^- \nu_\tau$

$K_1(1270)$ WIDTH

VALUE (MeV)	DOCUMENT ID

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.

87± 7 OUR AVERAGE Includes data from the 2 datablocks that follow this one.

PRODUCED BY K^-, BACKWARD SCATTERING, HYPERON EXCHANGE

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

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
75±15	700	GAVILLET	78	HBC	+	4.2 $K^- p \to \Xi^- K \pi\pi$

PRODUCED BY K BEAMS

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

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
90± 8	[6] DAUM	81C	CNTR	−	63 $K^- p \to K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
∼ 150	VERGEEST	79	HBC	−	4.2 $K^- p \to (\overline{K}\pi\pi)^- p$
150±71	[7] CARNEGIE	77	ASPK	±	13 $K^\pm p \to (K\pi\pi)^\pm p$
∼ 200	BRANDENB...	76	ASPK	±	13 $K^\pm p \to (K\pi\pi)^\pm p$
120	DAVIS	72	HBC	+	12 $K^+ p$
188±21	FIRESTONE	72B	DBC	+	12 $K^+ d$

[6] 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.

[7] 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	CHG	COMMENT
119.5± 5.2±6.7		GULER	11	BELL		$B^+ \to J/\psi K^+ \pi^+ \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
131 ±21	25k	[8] ABLIKIM	06C	BES2		$J/\psi \to \overline{K}^*(892)^0 K^+ \pi^-$
66 ±15	310	RODEBACK	81	HBC		4 $\pi^- p \to \Lambda K 2\pi$
60	40	CRENNELL	72	HBC	0	4.5 $\pi^- p \to \Lambda K 2\pi$
$127 ^{+7}_{-25}$		ASTIER	69	HBC	0	$\overline{p} p$
60	45	CRENNELL	67	HBC	0	6 $\pi^- p \to \Lambda K 2\pi$

[8] Systematic errors not estimated.

PRODUCED IN τ LEPTON DECAYS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
260^{+90}_{-70}±80	7k	ASNER	00B	CLEO	±	$\tau^- \to K^- \pi^+ \pi^- \nu_\tau$

$K_1(1270)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$K\rho$	(42 ± 6) %
Γ_2	$K_0^*(1430)\pi$	(28 ± 4) %
Γ_3	$K^*(892)\pi$	(16 ± 5) %
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
• • • We do not use the following data for averages, fits, limits, etc. • • •					
57 ± 5	MAZZUCATO	79	HBC	+	4.2 $K^- p \to \Xi^- (K\pi\pi)^+$
75 ± 6	CARNEGIE	77B	ASPK	±	13 $K^\pm p \to (K\pi\pi)^\pm p$

$\Gamma(K_0^*(1430)\pi)$ — Γ_2

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
26 ± 6	CARNEGIE	77B	ASPK	±	13 $K^\pm p \to (K\pi\pi)^\pm p$

$\Gamma(K^*(892)\pi)$ — Γ_3

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
14 ± 11	MAZZUCATO	79	HBC	+	4.2 $K^- p \to \Xi^- (K\pi\pi)^+$
2 ± 2	CARNEGIE	77B	ASPK	±	13 $K^\pm p \to (K\pi\pi)^\pm p$

$\Gamma(K\omega)$ — 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 $K^- p \to \Xi^- (K\pi\pi)^+$
24 ± 3	CARNEGIE	77B	ASPK	±	13 $K^\pm p \to (K\pi\pi)^\pm p$

$\Gamma(K f_0(1370))$ — 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	±	13 $K^\pm p \to (K\pi\pi)^\pm p$

$\Gamma(\gamma K^0)$ — Γ_6

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
$73.2\pm6.1\pm28.3$	ALAVI-HARATI	02B	KTEV	$K + A \to K^* + A$

$K_1(1270)$ BRANCHING RATIOS

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.42 ±0.06	[9] DAUM	81C	CNTR	63 $K^- p \to K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.584±0.043	[10] GULER	11	BELL	$B^+ \to J/\psi K^+ \pi^+ \pi^-$
dominant	RODEBACK	81	HBC	4 $\pi^- p \to \Lambda K 2\pi$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.28 ±0.04	[9] DAUM	81C	CNTR	63 $K^- p \to K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0201±0.0064	[10] GULER	11	BELL	$B^+ \to J/\psi K^+ \pi^+ \pi^-$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.16 ±0.05	[9] DAUM	81C	CNTR	63 $K^- p \to K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.171±0.023	[10] GULER	11	BELL	$B^+ \to J/\psi K^+ \pi^+ \pi^-$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.11 ±0.02	[9] DAUM	81C	CNTR	63 $K^- p \to K^- 2\pi p$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.225±0.052	[10] GULER	11	BELL	$B^+ \to J/\psi K^+ \pi^+ \pi^-$

$\Gamma(K\omega)/\Gamma(K\rho)$ — 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 $\pi^- p \to \Lambda K 2\pi$

$\Gamma(K f_0(1370))/\Gamma_{total}$ — Γ_5/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
0.03±0.02	[9] DAUM	81C	CNTR	63 $K^- p \to K^- 2\pi p$

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

VALUE	DOCUMENT ID		TECN	COMMENT
1.0±0.7	[9] DAUM	81C	CNTR	63 $K^- p \to K^- 2\pi p$

[9] Average from low and high t data.

[10] 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($\omega \to \pi^+\pi^-$) = $(1.53^{+0.11}_{-0.13})$% and B($K_0^*(1430) \to K\pi$) = (93 ± 10)% are used. Systematic uncertainties not estimated.

$K_1(1270)$ REFERENCES

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