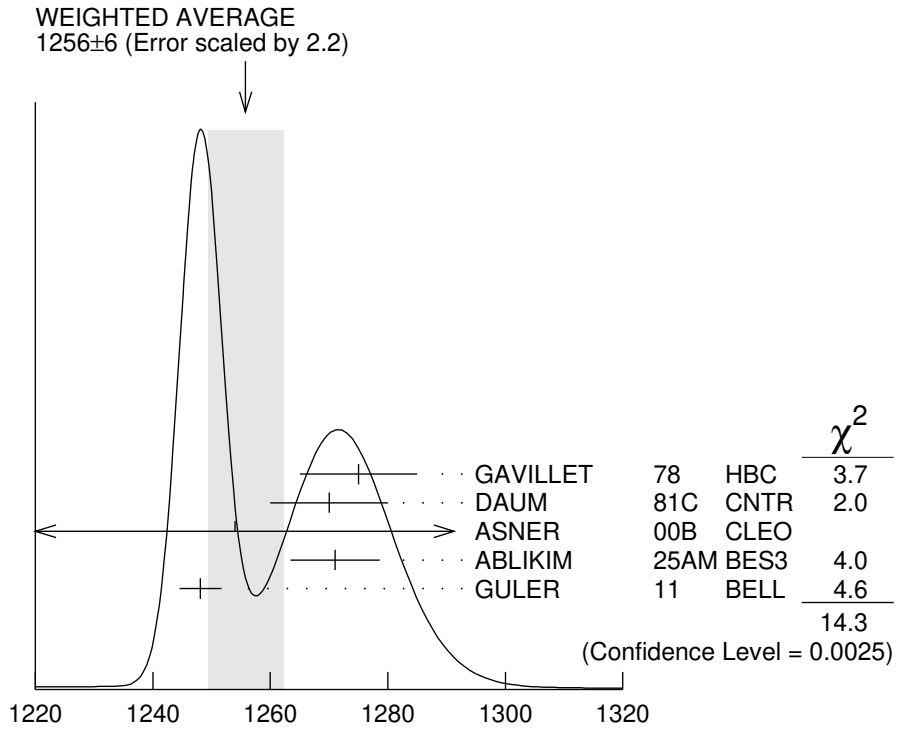
$K_1(1270)$

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

$K_1(1270)$ MASS

VALUE (MeV) *DOCUMENT ID*

1256±6 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 $K^- p \rightarrow \Xi^- (K\pi\pi)^+$

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*	*COMMENT*

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

1252 ± 9 OUR AVERAGE					Error includes scale factor of 2.7.
1271 ± 3 ±7		[1] ABLIKIM	25AM	BES3	$D^{+(0)} \rightarrow K^- \pi^+ \pi^{0(-)} e^+ \nu_e$
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. • • •					
1289.81 ± 0.56 ± 1.66	894k	AAIJ	18AI	LHCB	$D^0 \rightarrow K^\mp \pi^\pm \pi^\pm \pi^\mp$
1279 ±10	25k	[2] 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	$4.5\ \pi^- p \rightarrow \Lambda K 2\pi$
$1242 \begin{smallmatrix}+9\\-10\end{smallmatrix}$		[3] ASTIER	69	HBC	$\overline{p} p$
1300	45	CRENNELL	67	HBC	$6\ \pi^- p \rightarrow \Lambda K 2\pi$

[1] Using the relativistic Breit-Wigner parameterization in the amplitude analysis.
[2] Systematic errors not estimated.
[3] This was called the C meson.

PRODUCED IN τ LEPTON DECAYS

VALUE (MeV)	*EVTS*	*DOCUMENT ID*	*TECN*	*CHG*	*COMMENT*

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

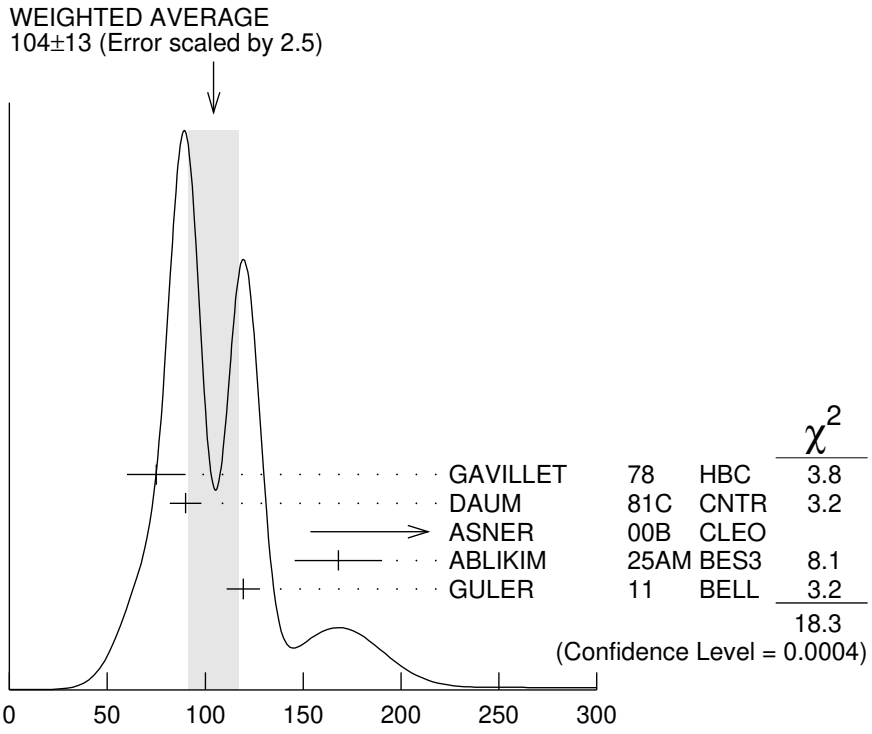
1254±33±34	7k	ASNER	00B	CLEO	±	$\tau^- \rightarrow K^- \pi^+ \pi^- \nu_\tau$

$K_1(1270)$ 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.

104±13 OUR AVERAGE Includes data from the 4 datablocks that follow this one. Error includes scale factor of 2.5. 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.						
75±15	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.					
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 $K^- p \rightarrow (\overline{K}\pi\pi)^- p$
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*
The data in this block is included in the average printed for a previous datablock.					
126 ±16 OUR AVERAGE	Error includes scale factor of 2.0.				
168 ±10 ±20		[1] ABLIKIM	25AM	BES3	$D^{+(0)} \rightarrow K^- \pi^+ \pi^{0(-)} e^+ \nu_e$
119.5 ± 5.2 ± 6.7		GULER	11	BELL	$B^+ \rightarrow J/\psi K^+ \pi^+ \pi^-$

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

116.11 ± 1.65 ± 2.96		894k		AAIJ	18AI	LHCB	$D^0 \to K^\mp \pi^\pm \pi^\pm \pi^\mp$
131	±21	25k	[2]	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	4.5 $\pi^- p \to \Lambda K 2\pi$
127	$^{+\ 7}_{-25}$			ASTIER	69	HBC	$\overline{p} p$
60		45		CRENNELL	67	HBC	6 $\pi^- p \to \Lambda K 2\pi$

[1] Using the relativistic Breit-Wigner parameterization in the amplitude analysis.
[2] Systematic errors not estimated.

PRODUCED IN τ LEPTON DECAYS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
The data in this block is included in the average printed for a previous datablock.						
$\mathbf{260^{+90}_{-70} \pm 80}$	7k	ASNER	00B	CLEO	±	$\tau^- \to K^- \pi^+ \pi^- \nu_\tau$

$K_1(1270)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor
Γ_1	$K\rho$	(53 ±8) %	2.1
Γ_2	$K_0^*(1430)\pi$	(14 ±8) %	4.0
Γ_3	$K^*(892)\pi$	(18 ±4) %	1.2
Γ_4	$K\omega$	(9.6±2.1) %	1.3
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±6.1±28.3	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
0.53 ±0.08 OUR FIT	Error includes scale factor of 2.1.				
0.53 ±0.08 OUR AVERAGE	Error includes scale factor of 2.2.				
0.588±0.045		AAIJ	25Q	LHCB	$B^+ \to \psi(2S) K^+\pi^+\pi^-$
0.42 ±0.06	[1]	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	[2]	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
0.14 ±0.08 OUR AVERAGE	Error includes scale factor of 4.0.				
0.099 ±0.022		AAIJ	25Q	LHCB	$B^+ \to \psi(2S) K^+\pi^+\pi^-$
0.28 ±0.04	[1]	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	[2]	GULER	11	BELL	$B^+ \to J/\psi K^+\pi^+\pi^-$

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

VALUE		DOCUMENT ID		TECN	COMMENT
0.18 ±0.04 OUR FIT	Error includes scale factor of 1.2.				
0.19 ±0.04 OUR AVERAGE	Error includes scale factor of 1.1.				
0.250±0.063		AAIJ	25Q	LHCB	$B^+ \to \psi(2S) K^+\pi^+\pi^-$
0.16 ±0.05	[1]	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	[2]	GULER	11	BELL	$B^+ \to J/\psi K^+\pi^+\pi^-$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.34 ±0.08 OUR FIT	Error includes scale factor of 1.5.			
0.30 ±0.26 OUR AVERAGE	Error includes scale factor of 3.1.			
0.203±0.021±0.087	ABLIKIM	25AM	BES3	$D^{+(0)} \to K^-\pi^+\pi^{0(-)} e^+\nu_e$
0.99 ±0.15 ±0.18	ABLIKIM	21U	BES3	$D_s^+ \to \overline{K}_1(1270)^0 K^+$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.096±0.021 OUR AVERAGE	Error includes scale factor of 1.3.			
0.063±0.031	AAIJ	25Q	LHCB	$B^+ \to \psi(2S) K^+\pi^+\pi^-$
0.11 ±0.02	[1] 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	[2] 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 $\pi^- p \to \Lambda K 2\pi$

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.03±0.02	[1] 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	[1] DAUM	81C	CNTR	63 $K^- p \to K^- 2\pi p$

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

$K_1(1270)$ REFERENCES

AAIJ	25Q	JHEP 2501 054	R. Aaij *et al.*	(LHCb Collab.)
ABLIKIM	25AM	PRL 135 091801	M. Ablikim *et al.*	(BESIII Collab.)
ABLIKIM	21U	PR D104 032011	M. Ablikim *et al.*	(BESIII Collab.)
AAIJ	18AI	EPJ C78 443	R. Aaij *et al.*	(LHCb Collab.)
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