

K₁(1270)

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

K₁(1270) MASS

VALUE (MeV) DOCUMENT ID
1273±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 → 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	DAUM	81C CNTR	-	63	K ⁻ p → K ⁻ 2π p
----------------	------	----------	---	----	--

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

~ 1276	¹ TORNQVIST	82B RVUE				
~ 1300	VERGEEST	79 HBC	-	4.2	K ⁻ p → (K̄ π π) ⁻ p	
1289±25	² CARNEGIE	77 ASPK	±	13	K [±] p → (K π π) [±] p	
~ 1300	BRANDENB...	76 ASPK	±	13	K [±] p → (K π π) [±] p	
~ 1270	OTTER	76 HBC	-	10,14,16	K ⁻ p → (K̄ π π) ⁻ p	
1260	DAVIS	72 HBC	+	12	K ⁺ p	
1234±12	FIRESTONE	72B DBC	+	12	K ⁺ d	

¹ From a unitarized quark-model calculation.

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 CHG COMMENT

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

1294±10	310	RODEBACK	81	HBC		4 π ⁻ p → Λ K 2π
1300	40	CRENNELL	72	HBC	0	4.5 π ⁻ p → Λ K 2π
1242 ⁺⁹ ₋₁₀		³ ASTIER	69	HBC	0	p̄ p
1300	45	CRENNELL	67	HBC	0	6 π ⁻ p → Λ K 2π

³ This was called the C meson.

K₁(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

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	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	⁴ CARNEGIE	77	ASPK	\pm	$13 K^\pm p \rightarrow (K \pi \pi)^\pm p$
~ 200	BRANDENB...	76	ASPK	\pm	$13 K^\pm p \rightarrow (K \pi \pi)^\pm p$
120	DAVIS	72	HBC	+	$12 K^+ p$
188 ± 21	FIRESTONE	72B	DBC	+	$12 K^+ d$

⁴ 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
-------------	------	-------------	------	-----	---------

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

66 ± 15	310	RODEBACK	81	HBC	$4 \pi^- p \rightarrow \Lambda K 2\pi$	
60	40	CRENNELL	72	HBC	0	$4.5 \pi^- p \rightarrow \Lambda K 2\pi$
127^{+7}_{-25}		ASTIER	69	HBC	0	$\bar{p} p$
60	45	CRENNELL	67	HBC	0	$6 \pi^- p \rightarrow \Lambda K 2\pi$

$K_1(1270)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $K \rho$	(42 \pm 6) %
Γ_2 $K_0^*(1430) \pi$	(28 \pm 4) %
Γ_3 $K^*(892) \pi$	(16 \pm 5) %
Γ_4 $K \omega$	(11.0 \pm 2.0) %
Γ_5 $K f_0(1370)$	(3.0 \pm 2.0) %
Γ_6 γK^0	seen

$K_1(1270)$ PARTIAL WIDTHS

$\Gamma(K\rho)$	DOCUMENT ID	TECN	CHG	COMMENT	Γ_1
-----------------	-------------	------	-----	---------	------------

• • • 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	\pm	$13 K^\pm p \rightarrow (K \pi \pi)^\pm p$

$\Gamma(K_0^*(1430)\pi)$

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	\pm	$13 K^\pm p \rightarrow (K\pi\pi)^\pm p$
------------	----------	----------	-------	--

$\Gamma(K^*(892)\pi)$

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	$+$	$4.2 K^- p \rightarrow \Xi^- (K\pi\pi)^+$
2 ± 2	CARNEGIE	77B ASPK	\pm	$13 K^\pm p \rightarrow (K\pi\pi)^\pm p$

$\Gamma(K\omega)$

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
-------	-------------	------	---------

0.42 ± 0.06	⁵ DAUM	81C CNTR	$63 K^- p \rightarrow K^- 2\pi p$
-----------------------------------	-------------------	----------	-----------------------------------

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

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	⁵ DAUM	81C CNTR	$63 K^- p \rightarrow K^- 2\pi p$
-----------------------------------	-------------------	----------	-----------------------------------

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

Γ_3/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
-------	-------------	------	---------

0.16 ± 0.05	⁵ DAUM	81C CNTR	$63 K^- p \rightarrow K^- 2\pi p$
-----------------------------------	-------------------	----------	-----------------------------------

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

Γ_4/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
-------	-------------	------	---------

0.11 ± 0.02	⁵ DAUM	81C CNTR	$63 K^- p \rightarrow K^- 2\pi p$
-----------------------------------	-------------------	----------	-----------------------------------

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

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	$4\pi^-p \rightarrow \Lambda K 2\pi$
-------	----	----------	--------	--------------------------------------

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

Γ_5/Γ

VALUE	DOCUMENT ID	TECN	COMMENT
-------	-------------	------	---------

0.03 ± 0.02	⁵ 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	⁵ DAUM	81C CNTR	$63 K^- p \rightarrow K^- 2\pi p$
------------------	-------------------	----------	-----------------------------------

⁵ Average from low and high t data.

$K_1(1270)$ REFERENCES

ALAVI-HARATI 02B	PRL 89 072001	A. Alavi-Harati <i>et al.</i>	(FNAL KTeV 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 26 703	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

OTHER RELATED PAPERS

SUZUKI 93	PR D47 1252	M. Suzuki	(LBL)
BAUBILLIER 82B	NP B202 21	M. Baubillier <i>et al.</i>	(BIRM, CERN, GLAS+)
FERNANDEZ 82	ZPHY C16 95	C. Fernandez <i>et al.</i>	(MADR, CERN, CDEF+) JP
GAVILLET 82	ZPHY C16 119	P. Gavillet <i>et al.</i>	(CERN, CDEF, PADO+)
SHEN 66	PRL 17 726	B.C. Shen <i>et al.</i>	(LRL)
Also 66	Private Comm.	G. Goldhaber	(LRL)
ALMEIDA 65	PL 16 184	S.P. Almeida <i>et al.</i>	(CAVE)
ARMENTEROS 64	PL 9 207	R. Armenteros <i>et al.</i>	(CERN, CDEF)
Also 66	PR 145 1095	N. Barash <i>et al.</i>	(COLU)