NODE=B055

$\Lambda(1690)\ 3/2^-$

$I(J^P) = 0(\frac{3}{2}^-)$ Status: ****

The measurements of the mass, width, and elasticity published before 1974 are now obsolete and have been omitted. They were last listed in our 1982 edition Physics Letters **111B** 1 (1982).

NODE=B055

$\Lambda(1690)$ POLE POSITION

NODE=B055225

REAL PART

NODE=B055RE
NODE=B055RE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1680 to 1700 (≈ 1690) OUR ESTIMATE				→ UNCHECKED ←
1683 ± 3	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
1697^{+6}_{-6}	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1689	ZHANG	13A	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15.

NODE=B055RE;LINKAGE=A

−2×IMAGINARY PART

NODE=B055IM
NODE=B055IM

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
60 to 80 (≈ 70) OUR ESTIMATE				→ UNCHECKED ←
72 ± 5	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
65 ± 14	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
53	ZHANG	13A	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15.

NODE=B055IM;LINKAGE=A

$\Lambda(1690)$ POLE RESIDUES

NODE=B055250

The normalized residue is the residue divided by $\Gamma_{pole}/2$.

NODE=B055250

Normalized residue in $N\overline{K} \to \Lambda(1690) \to N\overline{K}$

NODE=B055A00
NODE=B055A00

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.24 ±0.05	**−28 ± 5**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.251	3	[1] KAMANO	15	DPWA	Multichannel

[1] From the preferred solution A in KAMANO 15.

NODE=B055A00;LINKAGE=A

Normalized residue in $N\overline{K} \to \Lambda(1690) \to \Sigma\pi$

NODE=B055A01
NODE=B055A01

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.35 ±0.07	**175 ± 6**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.315	−173	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15.

NODE=B055A01;LINKAGE=A

Normalized residue in $N\overline{K} \to \Lambda(1690) \to \Lambda\eta$

NODE=B055A02
NODE=B055A02

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.05 ±0.02	**88 ± 8**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.00567	81	[1] KAMANO	15	DPWA	Multichannel

[1] From the preferred solution A in KAMANO 15.

NODE=B055A02;LINKAGE=A

Normalized residue in $N\overline{K} \to \Lambda(1690) \to \Lambda\sigma$

NODE=B055A05
NODE=B055A05

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.08±0.02	**−10 ± 6**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1690) \to \Sigma(1385)\pi$, S-wave

NODE=B055A03
NODE=B055A03

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.11 ±0.06	**170 ± 70**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.134	168	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15.

NODE=B055A03;LINKAGE=A

Normalized residue in $N\overline{K} \to \Lambda(1690) \to \Sigma(1385)\pi$, D-wave

NODE=B055A04
NODE=B055A04

MODULUS	PHASE (°)	DOCUMENT ID		TECN	COMMENT
0.06 ±0.04	**164 ± 15**	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.319	−22	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15.

NODE=B055A04;LINKAGE=A

Normalized residue in $N\overline{K} \to \Lambda(1690) \to N\overline{K}^*(892)$, S-wave

NODE=B055A06
NODE=B055A06

VALUE	DOCUMENT ID		TECN	COMMENT
0.05±0.04	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

Normalized residue in $N\overline{K} \to \Lambda(1690) \to N\overline{K}^*(892)$, D-wave

NODE=B055A07
NODE=B055A07

VALUE	DOCUMENT ID		TECN	COMMENT
0.18+-0.050-110+-45	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Lambda(1690)$ MASS

NODE=B055M

NODE=B055M

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
1685 to 1695 (≈ 1690) OUR ESTIMATE				→ UNCHECKED ←
1689 ±3	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
1691 ±3	ZHANG	13A	DPWA	$\overline{K}N$ multichannel
1695.7±2.6	KOISO	85	DPWA	$K^-p \to \Sigma\pi$
1690 ±5	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
1692 ±5	ALSTON-...	78	DPWA	$\overline{K}N \to \overline{K}N$
1690 ±3	HEPP	76B	DPWA	$K^-N \to \Sigma\pi$
1689 ±1	KANE	74	DPWA	$K^-p \to \Sigma\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1690 ±5	GOPAL	77	DPWA	$\overline{K}N$ multichannel
1687 or 1689	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
1692 ±4	CARROLL	76	DPWA	Isospin-0 total σ

[1] The two MARTIN 77 values are from a T-matrix pole and from a Breit-Wigner fit. Another D_{03} Λ at 1966 MeV is also suggested by MARTIN 77, but is very uncertain.

NODE=B055M;LINKAGE=A

$\Lambda(1690)$ WIDTH

NODE=B055W

NODE=B055W

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
60 to 80 (≈ 70) OUR ESTIMATE				→ UNCHECKED ←
75 ± 5	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
54 ± 5	ZHANG	13A	DPWA	$\overline{K}N$ multichannel
67.2± 5.6	KOISO	85	DPWA	$K^-p \to \Sigma\pi$
61 ± 5	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
64 ±10	ALSTON-...	78	DPWA	$\overline{K}N \to \overline{K}N$
82 ± 8	HEPP	76B	DPWA	$K^-N \to \Sigma\pi$
60 ± 4	KANE	74	DPWA	$K^-p \to \Sigma\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
60 ± 5	GOPAL	77	DPWA	$\overline{K}N$ multichannel
62 or 62	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel
38	CARROLL	76	DPWA	Isospin-0 total σ

[1] The two MARTIN 77 values are from a T-matrix pole and from a Breit-Wigner fit. Another D_{03} Λ at 1966 MeV is also suggested by MARTIN 77, but is very uncertain.

NODE=B055;LINKAGE=A

$\Lambda(1690)$ DECAY MODES

NODE=B055215;NODE=B055

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$N\overline{K}$	20–30 %	DESIG=1;OUR EST
Γ_2	$\Sigma\pi$	20–40 %	DESIG=2;OUR EST
Γ_3	$\Lambda\sigma$	(5.0±2.0) %	DESIG=14
Γ_4	$\Lambda\pi\pi$	∼ 25 %	DESIG=3;OUR EST
Γ_5	$\Sigma\pi\pi$	∼ 20 %	DESIG=4;OUR EST
Γ_6	$\Lambda\eta$		DESIG=6
Γ_7	$\Sigma(1385)\pi$, S-wave	(9 ±5) %	DESIG=5
Γ_8	$\Sigma(1385)\pi$, D-wave	(3.0±2.0) %	DESIG=9
Γ_9	$N\overline{K}^*(892)$, S=1/2, D-wave		DESIG=10
Γ_{10}	$N\overline{K}^*(892)$, S=3/2, S-wave		DESIG=12
Γ_{11}	$N\overline{K}^*(892)$, S=3/2, D-wave		DESIG=13

Λ(1690) BRANCHING RATIOS

NODE=B055220

$\Gamma(N\overline{K})/\Gamma_{total}$ Γ_1/Γ

NODE=B055R1
NODE=B055R1

VALUE	DOCUMENT ID		TECN	COMMENT
0.20 to 0.28 OUR ESTIMATE				→ UNCHECKED ←
0.23 ±0.05	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
0.25 ±0.04	ZHANG	13A	DPWA	$\overline{K}N$ multichannel
0.23 ±0.03	GOPAL	80	DPWA	$\overline{K}N \to \overline{K}N$
0.22 ±0.03	ALSTON-...	78	DPWA	$\overline{K}N \to \overline{K}N$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.239	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel
0.24 ±0.03	GOPAL	77	DPWA	See GOPAL 80
0.28 or 0.26	[2] MARTIN	77	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15. NODE=B055R1;LINKAGE=A
[2] The two MARTIN 77 values are from a T-matrix pole and from a Breit-Wigner fit. Another D_{03} Λ at 1966 MeV is also suggested by MARTIN 77, but is very uncertain. NODE=B055R1;LINKAGE=B

$\Gamma(\Sigma\pi)/\Gamma_{total}$ Γ_2/Γ

NODE=B055R00
NODE=B055R00

VALUE	DOCUMENT ID		TECN	COMMENT
0.50 ±0.10	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.387	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15. NODE=B055R00;LINKAGE=A

$\Gamma(\Lambda\eta)/\Gamma_{total}$ Γ_6/Γ

NODE=B055R01
NODE=B055R01

VALUE	DOCUMENT ID		TECN	COMMENT
∼ 0.01	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	[1] KAMANO	15	DPWA	Multichannel

[1] From the preferred solution A in KAMANO 15. NODE=B055R01;LINKAGE=A

$\Gamma(\Lambda\sigma)/\Gamma_{total}$ Γ_3/Γ

NODE=B055R07
NODE=B055R07

VALUE	DOCUMENT ID		TECN	COMMENT
0.05±0.02	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel

$\Gamma(\Sigma(1385)\pi, S\text{-wave})/\Gamma_{total}$ Γ_7/Γ

NODE=B055R02
NODE=B055R02

VALUE	DOCUMENT ID		TECN	COMMENT
0.09 ±0.05	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.062	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15. NODE=B055R02;LINKAGE=A

$\Gamma(\Sigma(1385)\pi, D\text{-wave})/\Gamma_{total}$ Γ_8/Γ

NODE=B055R03
NODE=B055R03

VALUE	DOCUMENT ID		TECN	COMMENT
0.03 ±0.02	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.308	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15. NODE=B055R03;LINKAGE=A

$\Gamma(N\overline{K}^*(892), S{=}1/2, D\text{-wave})/\Gamma_{total}$ Γ_9/Γ

NODE=B055R04
NODE=B055R04

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	SARANTSEV	19	DPWA	$\overline{K}N$ multichannel
not seen	[1] KAMANO	15	DPWA	$\overline{K}N$ multichannel

[1] From the preferred solution A in KAMANO 15. NODE=B055R04;LINKAGE=A

$\Gamma(N\overline{K}^*(892), S{=}3/2, S\text{-wave})/\Gamma_{total}$ Γ_{10}/Γ

NODE=B055R05
NODE=B055R05

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.003	KAMANO	15	DPWA	Multichannel

$\Gamma(N\overline{K}^*(892), S{=}3/2, D\text{-wave})/\Gamma_{total}$ Γ_{11}/Γ

NODE=B055R06
NODE=B055R06

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	[1] KAMANO	15	DPWA	Multichannel

[1] From the preferred solution A in KAMANO 15. NODE=B055R06;LINKAGE=A

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(1690) \to \Sigma\pi$ $(\Gamma_1\Gamma_2)^{1/2}/\Gamma$

NODE=B055R2
NODE=B055R2

VALUE	DOCUMENT ID		TECN	COMMENT
-0.27 ± 0.03	ZHANG	13A	DPWA	Multichannel
-0.34 ± 0.02	KOISO	85	DPWA	$K^-p \to \Sigma\pi$
-0.25 ± 0.03	GOPAL	77	DPWA	$\overline{K}N$ multichannel
-0.29 ± 0.03	HEPP	76B	DPWA	$K^-N \to \Sigma\pi$
-0.28 ± 0.03	LONDON	75	HLBC	$K^-p \to \Sigma^0\pi^0$
-0.28 ± 0.02	KANE	74	DPWA	$K^-p \to \Sigma\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
-0.30 or -0.28	[1] MARTIN	77	DPWA	$\overline{K}N$ multichannel

[1] The two MARTIN 77 values are from a T-matrix pole and from a Breit-Wigner fit. Another D_{03} Λ at 1966 MeV is also suggested by MARTIN 77, but is very uncertain.

NODE=B055R2;LINKAGE=A

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(1690) \to \Lambda\pi\pi$ $(\Gamma_1\Gamma_4)^{1/2}/\Gamma$

NODE=B055R3
NODE=B055R3

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.25 ± 0.02	[1] BARTLEY	68	HDBC	$K^-p \to \Lambda\pi\pi$

[1] BARTLEY 68 uses only cross-section data. The enhancement is not seen by PREVOST 71.

NODE=B055;LINKAGE=C

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(1690) \to \Sigma\pi\pi$ $(\Gamma_1\Gamma_5)^{1/2}/\Gamma$

NODE=B055R4
NODE=B055R4

VALUE	DOCUMENT ID		TECN	COMMENT
0.21	ARMENTEROS	68C	HDBC	$K^-N \to \Sigma\pi\pi$

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(1690) \to \Lambda\eta$ $(\Gamma_1\Gamma_6)^{1/2}/\Gamma$

NODE=B055R5
NODE=B055R5

VALUE	DOCUMENT ID		TECN	COMMENT
0.00 ± 0.03	BAXTER	73	DPWA	$K^-p \to$ neutrals

$(\Gamma_i\Gamma_f)^{1/2}/\Gamma_{total}$ in $N\overline{K} \to \Lambda(1690) \to \Sigma(1385)\pi$, S-wave $(\Gamma_1\Gamma_7)^{1/2}/\Gamma$

NODE=B055R6
NODE=B055R6

VALUE	DOCUMENT ID		TECN	COMMENT
-0.28 ± 0.06	ZHANG	13A	DPWA	Multichannel
$+0.27\pm0.04$	PREVOST	74	DPWA	$K^-N \to \Sigma(1385)\pi$

$\Lambda(1690)$ REFERENCES

NODE=B055

SARANTSEV	19	EPJ A55 180	A.V. Sarantsev *et al.*	(BONN, PNPI)	REFID=59986
KAMANO	15	PR C92 025205	H. Kamano *et al.*	(ANL, OSAK)	REFID=57507
ZHANG	13A	PR C88 035205	H. Zhang *et al.*	(KSU)	REFID=55441
KOISO	85	NP A433 619	H. Koiso *et al.*	(TOKY, MASA)	REFID=31795
PDG	82	PL 111B 1	M. Roos *et al.*	(HELS, CIT, CERN)	REFID=41167
GOPAL	80	Toronto Conf. 159	G.P. Gopal	(RHEL) IJP	REFID=31755
ALSTON-...	78	PR D18 182	M. Alston-Garnjost *et al.*	(LBL, MTHO+) IJP	REFID=31751
Also		PRL 38 1007	M. Alston-Garnjost *et al.*	(LBL, MTHO+) IJP	REFID=31752
GOPAL	77	NP B119 362	G.P. Gopal *et al.*	(LOIC, RHEL) IJP	REFID=31750
MARTIN	77	NP B127 349	B.R. Martin, M.K. Pidcock, R.G. Moorhouse	(LOUC+) IJP	REFID=31762
Also		NP B126 266	B.R. Martin, M.K. Pidcock	(LOUC)	REFID=31763
Also		NP B126 285	B.R. Martin, M.K. Pidcock	(LOUC) IJP	REFID=31764
CARROLL	76	PRL 37 806	A.S. Carroll *et al.*	(BNL) I	REFID=31760
HEPP	76B	PL 65B 487	V. Hepp *et al.*	(CERN, HEIDH, MPIM) IJP	REFID=31761
LONDON	75	NP B85 289	G.W. London *et al.*	(BNL, CERN, EPOL+)	REFID=31786
KANE	74	LBL-2452	D.F. Kane	(LBL) IJP	REFID=31759
PREVOST	74	NP B69 246	J. Prevost *et al.*	(SACL, CERN, HEID)	REFID=31785
BAXTER	73	NP B67 125	D.F. Baxter *et al.*	(OXF) IJP	REFID=31782
PREVOST	71	Amsterdam Conf.	J. Prevost	(CERN, HEID, SACL)	REFID=31810
ARMENTEROS	68C	NP B8 216	R. Armenteros *et al.*	(CERN, HEID, SACL) I	REFID=31797
BARTLEY	68	PRL 21 1111	J.H. Bartley *et al.*	(TUFTS, FSU, BRAN) I	REFID=31799