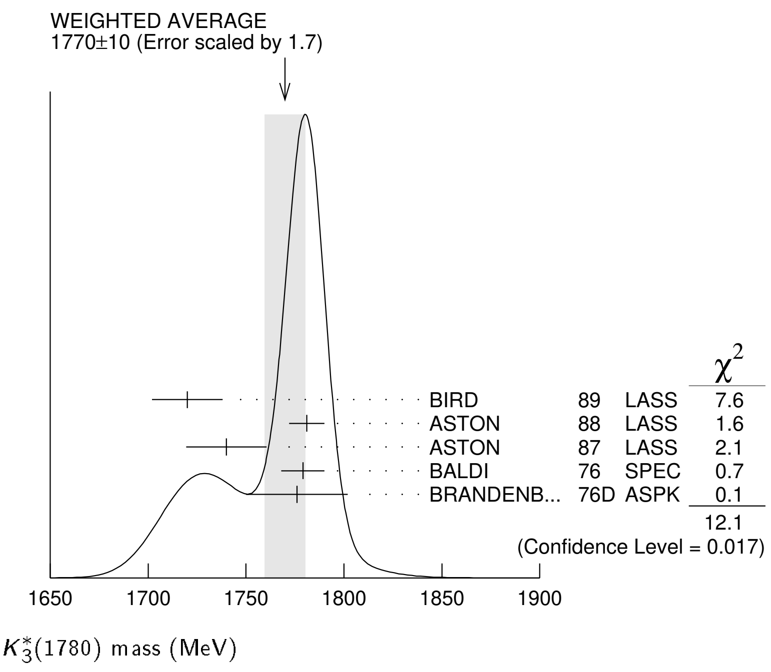
$K_3^*(1780)$

$I(J^P) = \frac{1}{2}(3^-)$

$K_3^*(1780)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1770±10 OUR AVERAGE		Error includes scale factor of 1.7. See the ideogram below.				
1720±10±15	6111	[1] BIRD	89	LASS	−	11 $K^- p \to \overline{K}^0 \pi^- p$
1781± 8± 4		[2] ASTON	88	LASS	0	11 $K^- p \to K^- \pi^+ n$
1740±14±15		[2] ASTON	87	LASS	0	11 $K^- p \to \overline{K}^0 \pi^+ \pi^- n$
1779±11		[3] BALDI	76	SPEC	+	10 $K^+ p \to K^0 \pi^+ p$
1776±26		[4] BRANDENB...	76D	ASPK	0	13 $K^\pm p \to K^\pm \pi^\mp N$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1749±10		ASTON	88B	LASS	−	11 $K^- p \to K^- \eta p$
1780± 9	300	BAUBILLIER	84B	HBC	−	8.25 $K^- p \to \overline{K}^0 \pi^- p$
1790±15		BAUBILLIER	82B	HBC	0	8.25 $K^- p \to K^0_S 2\pi N$
1784± 9	2060	CLELAND	82	SPEC	±	50 $K^+ p \to K^0_S \pi^\pm p$
1786±15		[5] ASTON	81D	LASS	0	11 $K^- p \to K^- \pi^+ n$
1762± 9	190	TOAFF	81	HBC	−	6.5 $K^- p \to \overline{K}^0 \pi^- p$
1850±50		ETKIN	80	MPS	0	6 $K^- p \to \overline{K}^0 \pi^+ \pi^-$
1812±28		BEUSCH	78	OMEG		10 $K^- p \to \overline{K}^0 \pi^+ \pi^- n$
1786± 8		CHUNG	78	MPS	0	6 $K^- p \to K^- \pi^+ n$

[1] From a partial wave amplitude analysis.
[2] From energy-independent partial-wave analysis.
[3] From a fit to Y^2_6 moment. $J^P = 3^-$ found.
[4] Confirmed by phase shift analysis of ESTABROOKS 78, yields $J^P = 3^-$.
[5] From a fit to the Y^0_6 moment.



$K_3^*(1780)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
164±17 OUR AVERAGE		Error includes scale factor of 1.1.				
187±31±20	6111	[6] BIRD	89	LASS	−	11 $K^- p \to \overline{K}^0 \pi^- p$
203±30± 8		[7] ASTON	88	LASS	0	11 $K^- p \to K^- \pi^+ n$
171±42±20		[7] ASTON	87	LASS	0	11 $K^- p \to \overline{K}^0 \pi^+ \pi^- n$
135±22		[8] BALDI	76	SPEC	+	10 $K^+ p \to K^0 \pi^+ p$

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

193^{+51}_{-37}		ASTON	88B	LASS	$-$	11 $K^- p \to K^- \eta p$
99 ± 30	300	BAUBILLIER	84B	HBC	$-$	8.25 $K^- p \to \overline{K}^0 \pi^- p$
~ 130		BAUBILLIER	82B	HBC	0	8.25 $K^- p \to K^0_S 2\pi N$
191 ± 24	2060	CLELAND	82	SPEC	$\pm$	50 $K^+ p \to K^0_S \pi^\pm p$
225 ± 60		[9] ASTON	81D	LASS	0	11 $K^- p \to K^- \pi^+ n$
~ 80	190	TOAFF	81	HBC	$-$	6.5 $K^- p \to \overline{K}^0 \pi^- p$
240 ± 50		ETKIN	80	MPS	0	6 $K^- p \to \overline{K}^0 \pi^+ \pi^-$
181 ± 44		[10] BEUSCH	78	OMEG		10 $K^- p \to \overline{K}^0 \pi^+ \pi^- n$
96 ± 31		CHUNG	78	MPS	0	6 $K^- p \to K^- \pi^+ n$
270 ± 70		[11] BRANDENB...	76D	ASPK	0	13 $K^\pm p \to K^\pm \pi^\mp N$

[6] From a partial wave amplitude analysis.

[7] From energy-independent partial-wave analysis.

[8] From a fit to Y^2_6 moment. $J^P = 3^-$ found.

[9] From a fit to Y^0_6 moment.

[10] Errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.

[11] ESTABROOKS 78 find that BRANDENBURG 76D data are consistent with 175 MeV width. Not averaged.

$K^*_3(1780)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$K\rho$	(45 ± 4) %	S=1.4
Γ_2	$K^*(892)\pi$	(27.3 ± 3.2) %	S=1.5
Γ_3	$K\pi$	(19.3 ± 1.0) %	
Γ_4	$K\eta$	(8.0 ± 1.5) %	S=1.4
Γ_5	$K^*_2(1430)\pi$	< 21 %	CL=95%

CONSTRAINED FIT INFORMATION

An overall fit to 4 branching ratios uses 5 measurements and one constraint to determine 4 parameters. The overall fit has a $\chi^2 =$ 2.2 for 2 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients $\left\langle \delta x_i \delta x_j \right\rangle / (\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\rm total}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_2	-84		
x_3	-33	-4	
x_4	-35	-14	26
	x_1	x_2	x_3

$K^*_3(1780)$ BRANCHING RATIOS

$\Gamma(K\rho)/\Gamma(K^*(892)\pi)$ Γ_1/Γ_2

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
1.66±0.31 OUR FIT Error includes scale factor of 1.5.				
1.52±0.21±0.10	ASTON 87	LASS	0	11 $K^- p \to \overline{K}^0 \pi^+ \pi^- n$

$\Gamma(K^*(892)\pi)/\Gamma(K\pi)$ Γ_2/Γ_3

VALUE	DOCUMENT ID	TECN	CHG	COMMENT
1.42±0.19 OUR FIT Error includes scale factor of 1.4.				
1.09±0.26	ASTON 84B	LASS	0	11 $K^- p \to \overline{K}^0 2\pi n$

$\Gamma(K\pi)/\Gamma_{total}$ Γ_3/Γ

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
0.193±0.010 OUR FIT					
0.188±0.010 OUR AVERAGE					
0.187±0.008±0.008	ASTON	88	LASS	0	11 $K^- p \rightarrow K^- \pi^+ n$
0.19 ±0.02	ESTABROOKS	78	ASPK	0	13 $K^\pm p \rightarrow K \pi N$

$\Gamma(K\eta)/\Gamma(K\pi)$ Γ_4/Γ_3

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
0.41±0.07 OUR FIT Error includes scale factor of 1.5.					
0.41±0.050	[12] BIRD	89	LASS	–	11 $K^- p \rightarrow \overline{K}^0 \pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.50±0.18	ASTON	88B	LASS	–	11 $K^- p \rightarrow K^- \eta p$

[12] This result supersedes ASTON 88B.

$\Gamma(K_2^*(1430)\pi)/\Gamma(K^*(892)\pi)$ Γ_5/Γ_2

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.78	95	ASTON	87	LASS	0	11 $K^- p \rightarrow \overline{K}^0 \pi^+ \pi^- n$

$K_3^*(1780)$ REFERENCES

BIRD	89	SLAC-332		(SLAC)
ASTON	88	NP B296 493	+Awaji, Bienz, Bird+	(SLAC, NAGO, CINC, INUS)
ASTON	88B	PL B201 169	+Awaji, Bienz+	(SLAC, NAGO, CINC, INUS) JP
ASTON	87	NP B292 693	+Awaji, D'Amore+	(SLAC, NAGO, CINC, INUS)
ASTON	84B	NP B247 261	+Carnegie, Dunwoodie+	(SLAC, CARL, OTTA)
BAUBILLIER	84B	ZPHY C26 37	+	(BIRM, CERN, GLAS, MICH, CURIN)
BAUBILLIER	82B	NP B202 21	+	(BIRM, CERN, GLAS, MSU, CURIN)
CLELAND	82	NP B208 189	+Delfosse, Dorsaz, Gloor	(DURH, GEVA, LAUS, PITT)
ASTON	81D	PL 99B 502	+Dunwoodie, Durkin, Fieguth+	(SLAC, CARL, OTTA) JP
TOAFF	81	PR D23 1500	+Musgrave, Ammar, Davis, Ecklund+	(ANL, KANS)
ETKIN	80	PR D22 42	+Foley, Lindenbaum, Kramer+	(BNL, CUNY) JP
BEUSCH	78	PL 74B 282	+Birman, Konigs, Otter+	(CERN, AACH3, ETH) JP
CHUNG	78	PRL 40 355	+Etkin+	(BNL, BRAN, CUNY, MASA, PENN) JP
ESTABROOKS	78	NP B133 490	+Carnegie+	(MCGI, CARL, DURH, SLAC) JP
Also	78B	PR D17 658	Estabrooks, Carnegie+	(MCGI, CARL, DURH+)
BALDI	76	PL 63B 344	+Boehringer, Dorsaz, Hungerbuhler+	(GEVA) JP
BRANDENB...	76D	PL 60B 478	Brandenburg, Carnegie, Cashmore+	(SLAC) JP

OTHER RELATED PAPERS

AGUILAR-...	73	PRL 30 672	Aguilar-Benitez, Chung, Eisner+	(BNL)
WALUCH	73	PR D8 2837	+Flatte, Friedman	(LBL)
CARMONY	71	PRL 27 1160	+Cords, Clopp, Erwin, Meiere+	(PURD, UCD, IUPU)
FIRESTONE	71	PL 36B 513	+Goldhaber, Lissauer, Trilling	(LBL)