$f_2'(1525)$

$I^G(J^{PC}) = 0^+(2^{++})$

$f_2'(1525)$ MASS

VALUE (MeV)	*DOCUMENT ID*
1525±5 OUR ESTIMATE	This is only an educated guess; the error given is larger than the error on the average of the published values.

PRODUCED BY PION BEAM

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1547^{+10}_{-2}		[1] LONGACRE	86	MPS	22 $\pi^- p \to K^0_S K^0_S n$
1496^{+9}_{-8}		[2] CHABAUD	81	ASPK	6 $\pi^- p \to K^+ K^- n$
1497^{+8}_{-9}		CHABAUD	81	ASPK	18.4 $\pi^- p \to K^+ K^- n$
1492±29		GORLICH	80	ASPK	17 π^- *p* polarized $\to$ $K^+ K^- n$
1502±25		[3] CORDEN	79	OMEG	12–15 $\pi^- p \to \pi^+ \pi^- n$
1480	14	CRENNELL	66	HBC	6.0 $\pi^- p \to K^0_S K^0_S n$

[1] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.
[2] CHABAUD 81 is a reanalysis of PAWLICKI 77 data.
[3] From an amplitude analysis where the $f_2'(1525)$ width and elasticity are in complete disagreement with the values obtained from $K\overline{K}$ channel, making the solution dubious.

PRODUCED BY $K^\pm$ BEAM

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1524.6± 1.4 OUR AVERAGE		Includes data from the datablock that follows this one. Error includes scale factor of 1.1.			
1526.8± 4.3		ASTON	88D	LASS	11 $K^- p \to K^0_S K^0_S \Lambda$
1504 ±12		BOLONKIN	86	SPEC	40 $K^- p \to K^0_S K^0_S Y$
1529 ± 3		ARMSTRONG	83B	OMEG	18.5 $K^- p \to K^- K^+ \Lambda$
1521 ± 6	650	AGUILAR-...	81B	HBC	4.2 $K^- p \to \Lambda K^+ K^-$
1521 ± 3	572	ALHARRAN	81	HBC	8.25 $K^- p \to \Lambda K\overline{K}$
1522 ± 6	123	BARREIRO	77	HBC	4.15 $K^- p \to \Lambda K^0_S K^0_S$
1528 ± 7	166	EVANGELISTA	77	OMEG	10 $K^- p \to K^+ K^- (\Lambda, \Sigma)$
1527 ± 3	120	BRANDENB...	76C	ASPK	13 $K^- p \to K^+ K^- (\Lambda, \Sigma)$
1519 ± 7	100	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p \to K\overline{K} (\Lambda, \Sigma)$

PRODUCED IN e^+e^- ANNIHILATION

VALUE (MeV)		*DOCUMENT ID*		*TECN*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.					
1524 ± 4 OUR AVERAGE	Error includes scale factor of 1.2.				
1535 ± 5 ± 4		ABREU	96C	DLPH	$\gamma\gamma \to K^+K^-$ E_{cm}^{ee}= 91.2 GeV
1516 ± 5 $^{+9}_{-15}$		BAI	96C	BES	$J/\psi \to \gamma K^+K^-$
1529 ±10		ACCIARRI	95J	L3	$\gamma\gamma \to K^0_S K^0_S$ E_{cm}^{ee}= 88–94 GeV
1531.6±10.0		AUGUSTIN	88	DM2	$J/\psi \to \gamma K^+K^-$
1515 ± 5		[4] FALVARD	88	DM2	$J/\psi \to \phi K^+K^-$
1525 ±10 ±10		BALTRUSAIT...	87	MRK3	$J/\psi \to \gamma K^+K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1496 ± 2		[5] FALVARD	88	DM2	$J/\psi \to \phi K^+K^-$

[4] From an analysis ignoring interference with $f_J(1710)$.
[5] From an analysis including interference with $f_J(1710)$.

$f_2'(1525)$ WIDTH

VALUE (MeV)	*DOCUMENT ID*		*COMMENT*
76±10 OUR ESTIMATE	This is only an educated guess; the error given is larger than the error on the average of the published values.		
73^{+6}_{-5} OUR FIT			
76±10	PDG	90	For fitting

PRODUCED BY PION BEAM

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •				
108^{+5}_{-2}	[6] LONGACRE	86	MPS	22 $\pi^- p \to K^0_S K^0_S n$
69^{+22}_{-16}	[7] CHABAUD	81	ASPK	6 $\pi^- p \to K^+K^- n$
137^{+23}_{-21}	CHABAUD	81	ASPK	18.4 $\pi^- p \to K^+K^- n$
150^{+83}_{-50}	GORLICH	80	ASPK	17 π^- $p$polarized $\to$ $K^+K^- n$
165±42	[8] CORDEN	79	OMEG	12–15 $\pi^- p \to$ $\pi^+\pi^- n$
92^{+39}_{-22}	[9] POLYCHRO...	79	STRC	7 $\pi^- p \to n K^0_S K^0_S$

[6] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.
[7] CHABAUD 81 is a reanalysis of PAWLICKI 77 data.
[8] From an amplitude analysis where the $f_2'(1525)$ width and elasticity are in complete disagreement with the values obtained from $K\overline{K}$ channel, making the solution dubious.
[9] From a fit to the D with $f_2(1270)$-$f_2'(1525)$ interference. Mass fixed at 1516 MeV.

PRODUCED BY $K^{\pm}$ BEAM

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
76± 5 OUR AVERAGE	Includes data from the datablock that follows this one.				
90±12		ASTON	88D	LASS	11 $K^- p \rightarrow K^0_S K^0_S \Lambda$
73±18		BOLONKIN	86	SPEC	40 $K^- p \rightarrow K^0_S K^0_S Y$
83±15		ARMSTRONG	83B	OMEG	18.5 $K^- p \rightarrow K^- K^+ \Lambda$
85±16	650	AGUILAR-...	81B	HBC	4.2 $K^- p \rightarrow \Lambda K^+ K^-$
80^{+14}_{-11}	572	ALHARRAN	81	HBC	8.25 $K^- p \rightarrow \Lambda K \overline{K}$
72±25	166	EVANGELISTA	77	OMEG	10 $K^- p \rightarrow K^+ K^- (\Lambda, \Sigma)$
69±22	100	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p \rightarrow K \overline{K} (\Lambda, \Sigma)$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
62^{+19}_{-14}	123	BARREIRO	77	HBC	4.15 $K^- p \rightarrow \Lambda K^0_S K^0_S$
61± 8	120	BRANDENB...	76C	ASPK	13 $K^- p \rightarrow K^+ K^- (\Lambda, \Sigma)$

PRODUCED IN $e^+ e^-$ ANNIHILATION

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
The data in this block is included in the average printed for a previous datablock.				
66± 8 OUR AVERAGE				
60±20±19	ABREU	96C	DLPH	$\gamma\gamma \rightarrow K^+ K^-$ E^{ee}_{cm}= 91.2 GeV
$60 \pm 23^{+13}_{-20}$	BAI	96C	BES	$J/\psi \rightarrow \gamma K^+ K^-$
103±30	AUGUSTIN	88	DM2	$J/\psi \rightarrow \gamma K^+ K^-$
62±10	[10] FALVARD	88	DM2	$J/\psi \rightarrow \phi K^+ K^-$
85±35	BALTRUSAIT...	87	MRK3	$J/\psi \rightarrow \gamma K^+ K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
76±40	ACCIARRI	95J	L3	$\gamma\gamma \rightarrow K_S K_S$ E^{ee}_{cm}= 88–94 GeV
100± 3	[11] FALVARD	88	DM2	$J/\psi \rightarrow \phi K^+ K^-$

[10] From an analysis ignoring interference with $f_J(1710)$.

[11] From an analysis including interference with $f_J(1710)$.

$f'_2(1525)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$K\overline{K}$	(88.8 ±3.1) %
Γ_2	$\eta\eta$	(10.3 ±3.1) %
Γ_3	$\pi\pi$	(8.2 ±1.5) $\times 10^{-3}$
Γ_4	$\gamma\gamma$	(1.32±0.21) $\times 10^{-6}$
Γ_5	$K\overline{K}^*(892)$ + c.c.	
Γ_6	$\pi\pi\eta$	
Γ_7	$\pi K\overline{K}$	
Γ_8	$\pi^+\pi^+\pi^-\pi^-$	

CONSTRAINED FIT INFORMATION

An overall fit to the total width, 2 partial widths, a combination of partial widths obtained from integrated cross sections, and 3 branching ratios uses 14 measurements and one constraint to determine 5 parameters. The overall fit has a $\chi^2 = 11.4$ for 10 degrees of freedom.

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

x_2	−100			
x_3	−3	−1		
x_4	−7	7	1	
Γ	−32	32	−1	−42
	x_1	x_2	x_3	x_4

	Mode	Rate (MeV)
Γ_1	$K\overline{K}$	$65\ ^{+5}_{-4}$
Γ_2	$\eta\eta$	7.6 ± 2.6
Γ_3	$\pi\pi$	0.60 ± 0.12
Γ_4	$\gamma\gamma$	$(9.7 \pm 1.4) \times 10^{-5}$

$f_2'(1525)$ PARTIAL WIDTHS

$\Gamma(K\overline{K})$ Γ_1

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
65^{+5}_{-4} OUR FIT				
63^{+6}_{-5}	[12] LONGACRE	86	MPS	22 $\pi^- p \rightarrow K^0_S K^0_S n$

$\Gamma(\pi\pi)$ Γ_3

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
0.60±0.12 OUR FIT				
1.4 $^{+1.0}_{-0.5}$	[12] LONGACRE	86	MPS	22 $\pi^- p \rightarrow K^0_S K^0_S n$

$\Gamma(\eta\eta)$ Γ_2

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
7.6±2.5 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
24 $^{+3}_{-1}$	[12] LONGACRE	86	MPS	22 $\pi^- p \rightarrow K^0_S K^0_S n$

[12] From a partial-wave analysis of data using a K-matrix formalism with 5 poles.

$f_2'(1525)$ Γ(i)Γ(γγ)/Γ(total)

$\Gamma(K\overline{K}) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_1\Gamma_4/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
0.086 ±0.012 OUR FIT				
0.086 ±0.012 OUR AVERAGE				
0.093 ±0.018 ±0.022	[13] ACCIARRI	95J	L3	E_{cm}^{ee} = 88–94 GeV
0.067 ±0.008 ±0.015	[13] ALBRECHT	90G	ARG	$e^+e^- \to e^+e^-K^+K^-$
0.11 $^{+0.03}_{-0.02}$ ±0.02	BEHREND	89C	CELL	$e^+e^- \to e^+e^-K^0_SK^0_S$
0.10 $^{+0.04}_{-0.03}$ $^{+0.03}_{-0.02}$	BERGER	88	PLUT	$e^+e^- \to e^+e^-K^0_SK^0_S$
0.12 ±0.07 ±0.04	[13] AIHARA	86B	TPC	$e^+e^- \to e^+e^-K^+K^-$
0.11 ±0.02 ±0.04	[13] ALTHOFF	83	TASS	$e^+e^- \to e^+e^-K\overline{K}$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.0314±0.0050±0.0077	[14] ALBRECHT	90G	ARG	$e^+e^- \to e^+e^-K^+K^-$

[13] Using an incoherent background.
[14] Using a coherent background.

$f_2'(1525)$ BRANCHING RATIOS

$\Gamma(\eta\eta)/\Gamma(K\overline{K})$ — Γ_2/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.12±0.04 OUR FIT				
0.11±0.04	[15] PROKOSHKIN	91	GAM4	300 $\pi^- p \to \pi^- p\eta\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<0.50	BARNES	67	HBC	4.6,5.0 $K^- p$

[15] Combining results of GAM4 with those of WA76 on $K\overline{K}$ central production and results of CBAL, MRK3 and DM2 on $J/\psi \to \gamma\eta\eta$.

$\Gamma(\pi\pi)/\Gamma_{total}$ — Γ_3/Γ

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
0.0082±0.0016 OUR FIT					
0.0075±0.0016 OUR AVERAGE					
0.007 ±0.002		COSTA...	80	OMEG	10 $\pi^- p \to K^+K^- n$
0.027 $^{+0.071}_{-0.013}$		[16] GORLICH	80	ASPK	17,18 $\pi^- p$
0.0075±0.0025		[16,17] MARTIN	79	RVUE	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.06	95	AGUILAR-...	81B	HBC	4.2 $K^- p \to \Lambda K^+K^-$
0.19 ±0.03		CORDEN	79	OMEG	12–15 $\pi^- p \to \pi^+\pi^- n$
<0.045	95	BARREIRO	77	HBC	4.15 $K^- p \to \Lambda K^0_SK^0_S$
0.012 ±0.004		[16] PAWLICKI	77	SPEC	6 $\pi N \to K^+K^- N$
<0.063	90	BRANDENB...	76C	ASPK	13 $K^- p \to K^+K^-(\Lambda,\Sigma)$
<0.0086		[16] BEUSCH	75B	OSPK	8.9 $\pi^- p \to K^0\overline{K}^0 n$

[16] Assuming that the $f_2'(1525)$ is produced by an one-pion exchange production mechanism.

[17] MARTIN 79 uses the PAWLICKI 77 data with different input value of the $f_2'(1525) \to K\overline{K}$ branching ratio.

$\Gamma(\pi\pi)/\Gamma(K\overline{K})$ Γ_3/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
0.0092±0.0018 OUR FIT				
0.075 ±0.035	AUGUSTIN	87	DM2	$J/\psi \to \gamma\pi^+\pi^-$

$\Gamma(\pi\pi\eta)/\Gamma(K\overline{K})$ Γ_6/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.41	95	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p$
<0.3	67	AMMAR	67	HBC	

$[\Gamma(K\overline{K}^*(892)+\text{c.c.})+\Gamma(\pi K\overline{K})]/\Gamma(K\overline{K})$ $(\Gamma_5+\Gamma_7)/\Gamma_1$

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.35	95	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p$
<0.4	67	AMMAR	67	HBC	

$\Gamma(\pi^+\pi^+\pi^-\pi^-)/\Gamma(K\overline{K})$ Γ_8/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<0.32	95	AGUILAR-...	72B	HBC	3.9,4.6 $K^- p$

$\Gamma(\eta\eta)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.10±0.03	[18] PROKOSHKIN	91	GAM4	300 $\pi^- p \to \pi^- p\eta\eta$

[18] Combining results of GAM4 with those of WA76 on $K\overline{K}$ central production and results of CBAL, MRK3 and DM2 on $J/\psi \to \gamma\eta\eta$.

$f_2'(1525)$ REFERENCES

ABREU	96C	PL B379 309	+Adam, Adye+	(DELPHI Collab.)
BAI	96C	PRL 77 3959	J.Z. Bai+	(BES Collab.)
ACCIARRI	95J	PL B363 118	+Adam, Adriani, Aguilar-Benitez+	(L3 Collab.)
PROKOSHKIN	91	SPD 36 155		(GAM2, GAM4 Collab.)
		Translated from DANS 316 900.		
ALBRECHT	90G	ZPHY C48 183	+Ehrlichmann, Harder+	(ARGUS Collab.)
PDG	90	PL B239	Hernandez, Stone, Porter+	(IFIC, BOST, CIT+)
BEHREND	89C	ZPHY C43 91	+Criegee, Dainton+	(CELLO Collab.)
ASTON	88D	NP B301 525	+Awaji, Bienz+	(SLAC, NAGO, CINC, INUS)
AUGUSTIN	88	PRL 60 2238	+Calcaterra+	(DM2 Collab.)
BERGER	88	ZPHY C37 329	+Genzel, Lackas+	(PLUTO Collab.)
FALVARD	88	PR D38 2706	+Ajaltouni+	(CLER, FRAS, LALO, PADO)
AUGUSTIN	87	ZPHY C36 369	+Cosme+	(LALO, CLER, FRAS, PADO)
BALTRUSAIT...	87	PR D35 2077	Baltrusaitis, Coffman, Dubois+	(Mark III Collab.)
AIHARA	86B	PRL 57 404	+Alston-Garnjost+	(TPC-2γ Collab.)
BOLONKIN	86	SJNP 43 776	+Bloshenko+	(ITEP) JP
		Translated from YAF 43 1211.		

LONGACRE	86	PL B177 223	+Etkin+ (BNL, BRAN, CUNY, DUKE, NDAM)	
ALTHOFF	83	PL 121B 216	+Brandelik, Boerner, Burkhardt+ (TASSO Collab.)	
ARMSTRONG	83B	NP B224 193	+ (BARI, BIRM, CERN, MILA, CURIN+)	
AGUILAR-...	81B	ZPHY C8 313	Aguilar-Benitez, Albajar+ (CERN, CDEF, MADR+)	
ALHARRAN	81	NP B191 26	+Baubillier+ (BIRM, CERN, GLAS, MICH, CURIN)	
CHABAUD	81	APP B12 575	+Niczyporuk, Becker+ (CERN, CRAC, MPIM)	
COSTA...	80	NP B175 402	Costa De Beauregard+ (BARI, BONN, CERN+)	
GORLICH	80	NP B174 16	+Niczyporuk+ (CRAC, MPIM, CERN, ZEEM)	
CORDEN	79	NP B157 250	+Dowell, Garvey+ (BIRM, RHEL, TELA, LOWC)	JP
MARTIN	79	NP B158 520	+Ozmutlu (DURH)	
POLYCHRO...	79	PR D19 1317	Polychronakos, Cason, Bishop+ (NDAM, ANL)	
BARREIRO	77	NP B121 237	+Diaz, Gay, Hemingway+ (CERN, AMST, NIJM, OXF)	
EVANGELISTA	77	NP B127 384	+ (BARI, BONN, CERN, DARE, GLAS+)	
PAWLICKI	77	PR D15 3196	+Ayres, Cohen, Diebold, Kramer, Wicklund (ANL)	IJP
BRANDENB...	76C	NP B104 413	Brandenburg, Carnegie, Cashmore+ (SLAC)	
BEUSCH	75B	PL 60B 101	+Birman, Websdale, Wetzel (CERN, ETH)	
AGUILAR-...	72B	PR D6 29	Aguilar-Benitez, Chung, Eisner, Samios (BNL)	
AMMAR	67	PRL 19 1071	+Davis, Hwang, Dagan, Derrick+ (NWES, ANL)	JP
BARNES	67	PRL 19 964	+Dornan, Goldberg, Leitner+ (BNL, SYRA)	IJPC
CRENNELL	66	PRL 16 1025	+Kalbfleisch, Lai, Scarr, Schumann+ (BNL)	I

OTHER RELATED PAPERS

JENNI	83	PR D27 1031	+Burke, Telnov, Abrams, Blocker+ (SLAC, LBL)
ARMSTRONG	82	PL 110B 77	+Baubillier+ (BARI, BIRM, CERN, MILA, CURIN+)
ETKIN	82B	PR D25 1786	+Foley, Lai+ (BNL, CUNY, TUFTS, VAND)
ABRAMS	67B	PRL 18 620	+Kehoe, Glasser, Sechi-Zorn, Wolsky (UMD)
BARNES	65	PRL 15 322	+Culwick, Guidoni, Kalbfleisch, Goz+ (BNL, SYRA)