$a_2(1320)$

$I^G(J^{PC}) = 1^-(2^{++})$

a_2(1320) MASS

VALUE (MeV)	DOCUMENT ID

1318.3$^{+0.5}_{-0.6}$ OUR AVERAGE Includes data from the 4 datablocks that follow this one. Error includes scale factor of 1.2.

3π MODE

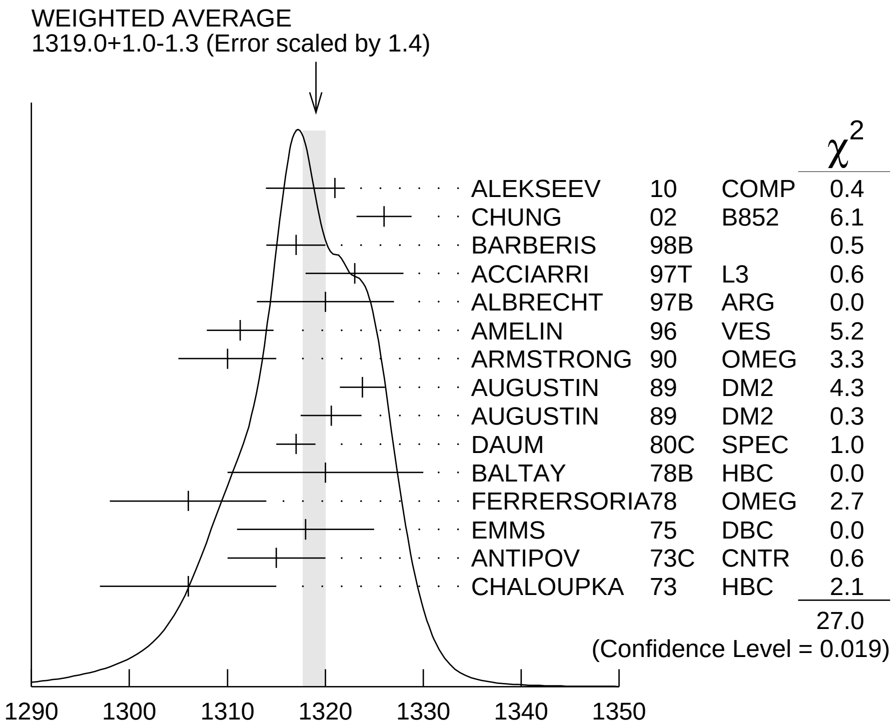
VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT

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

1319.0$^{+}_{-}$ $^{1.0}_{1.3}$ OUR AVERAGE Error includes scale factor of 1.4. See the ideogram below.

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1321 ± 1 $^{+0}_{-7}$	420k	ALEKSEEV	10	COMP		190 $\pi^- Pb \to \pi^-\pi^-\pi^+ Pb'$
1326 ± 2 ±2		CHUNG	02	B852		18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$
1317 ± 3		BARBERIS	98B			450 $p p \to p_f \pi^+\pi^-\pi^0 p_s$
1323 ± 4 ±3		ACCIARRI	97T	L3		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
1320 ± 7		ALBRECHT	97B	ARG		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
1311.3± 1.6±3.0	72.4k	AMELIN	96	VES		36 $\pi^- p \to \pi^+\pi^-\pi^0 n$
1310 ± 5		ARMSTRONG	90	OMEG	0	300.0$p p \to p p \pi^+\pi^-\pi^0$
1323.8± 2.3	4022	AUGUSTIN	89	DM2	±	$J/\psi \to \rho^\pm a_2^\mp$
1320.6± 3.1	3562	AUGUSTIN	89	DM2	0	$J/\psi \to \rho^0 a_2^0$
1317 ± 2	25k	[1] DAUM	80C	SPEC	−	63,94 $\pi^- p \to 3\pi p$
1320 ±10	1097	[1] BALTAY	78B	HBC	+0	15 $\pi^+ p \to p 4\pi$
1306 ± 8		FERRERSORIA	78	OMEG	−	9 $\pi^- p \to p 3\pi$
1318 ± 7	1.6k	[1] EMMS	75	DBC	0	4 $\pi^+ n \to p(3\pi)^0$
1315 ± 5		[1] ANTIPOV	73C	CNTR	−	25,40 $\pi^- p \to p\eta\pi^-$
1306 ± 9	1580	CHALOUPKA	73	HBC	−	3.9 $\pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1300 ± 2 ±4	18k	[2] SCHEGELSKY	06	RVUE	0	$\gamma\gamma \to \pi^+\pi^-\pi^0$
1305 ±14		CONDO	93	SHF		$\gamma p \to n\pi^+\pi^+\pi^-$
1310 ± 2		[1] EVANGELIS...	81	OMEG	−	12 $\pi^- p \to 3\pi p$
1343 ±11	490	BALTAY	78B	HBC	0	15 $\pi^+ p \to \Delta 3\pi$
1309 ± 5	5k	BINNIE	71	MMS	−	$\pi^- p$ near a_2 threshold
1299 ± 6	28k	BOWEN	71	MMS	−	5 $\pi^- p$
1300 ± 6	24k	BOWEN	71	MMS	+	5 $\pi^+ p$
1309 ± 4	17k	BOWEN	71	MMS	−	7 $\pi^- p$
1306 ± 4	941	ALSTON-...	70	HBC	+	7.0 $\pi^+ p \to 3\pi p$

[1] From a fit to $J^P = 2^+$ $\rho\pi$ partial wave.
[2] From analysis of L3 data at 183–209 GeV.



$a_2(1320)$ mass, 3π mode (MeV)

$K\overline{K}$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
The data in this block is included in the average printed for a previous datablock.					
1318.1 ± 0.7 OUR AVERAGE					
1319 ± 5	4700	[3,4] CLELAND	82B	SPEC	+	50 $\pi^+ p \to K^0_S K^+ p$
1324 ± 6	5200	[3,4] CLELAND	82B	SPEC	−	50 $\pi^- p \to K^0_S K^- p$
1320 ± 2	4000	CHABAUD	80	SPEC	−	17 $\pi^- \mathrm{A} \to K^0_S K^- \mathrm{A}$
1312 ± 4	11000	CHABAUD	78	SPEC	−	9.8 $\pi^- p \to K^- K^0_S p$
1316 ± 2	4730	CHABAUD	78	SPEC	−	18.8 $\pi^- p \to K^- K^0_S p$
1318 ± 1		[3,5] MARTIN	78D	SPEC	−	10 $\pi^- p \to K^0_S K^- p$
1320 ± 2	2724	MARGULIE	76	SPEC	−	23 $\pi^- p \to K^- K^0_S p$
1313 ± 4	730	FOLEY	72	CNTR	−	20.3 $\pi^- p \to K^- K^0_S p$
1319 ± 3	1500	[5] GRAYER	71	ASPK	−	17.2 $\pi^- p \to K^- K^0_S p$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1304 ±10	870	[6] SCHEGELSKY	06A	RVUE	0	$\gamma\gamma \to K^0_S K^0_S$
1330 ±11	1000	[3,4] CLELAND	82B	SPEC	+	30 $\pi^+ p \to K^0_S K^+ p$
1324 ± 5	350	HYAMS	78	ASPK	+	12.7 $\pi^+ p \to K^+ K^0_S p$

[3] From a fit to $J^P = 2^+$ partial wave.
[4] Number of events evaluated by us.
[5] Systematic error in mass scale subtracted.
[6] From analysis of L3 data at 91 and 183–209 GeV.

$\eta\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
The data in this block is included in the average printed for a previous datablock.					
1317.7±1.4 OUR AVERAGE					
1308 ±9		BARBERIS 00H			450 $pp \to p_f \eta\pi^0 p_s$
1316 ±9		BARBERIS 00H			450 $pp \to \Delta_f^{++} \eta\pi^- p_s$
1317 ±1 ±2		THOMPSON 97	MPS		18 $\pi^- p \to \eta\pi^- p$
1315 ±5 ±2		[7] AMSLER 94D	CBAR		0.0 $\overline{p}p \to \pi^0\pi^0\eta$
1325.1±5.1		AOYAGI 93	BKEI		$\pi^- p \to \eta\pi^- p$
1317.7±1.4±2.0		BELADIDZE 93	VES		$37\pi^- N \to \eta\pi^- N$
1323 ±8	1000	[8] KEY 73	OSPK	−	6 $\pi^- p \to p\pi^-\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1309 ±4		ANISOVICH 09	RVUE		$\overline{p}p$, πN
1324 ±5		ARMSTRONG 93C	E760	0	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$
1336.2±1.7	2561	DELFOSSE 81	SPEC	+	$\pi^\pm p \to p\pi^\pm\eta$
1330.7±2.4	1653	DELFOSSE 81	SPEC	−	$\pi^\pm p \to p\pi^\pm\eta$
1324 ±8	6200	[8,9] CONFORTO 73	OSPK	−	6 $\pi^- p \to p MM^-$

[7] The systematic error of 2 MeV corresponds to the spread of solutions.
[8] Error includes 5 MeV systematic mass-scale error.
[9] Missing mass with enriched MMS = $\eta\pi^-$, $\eta = 2\gamma$.

$\eta'\pi$ MODE

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
The data in this block is included in the average printed for a previous datablock.			
1322 ± 7 OUR AVERAGE			
1318 ± 8 $^{+3}_{-5}$	IVANOV 01	B852	18 $\pi^- p \to \eta'\pi^- p$
1327.0±10.7	BELADIDZE 93	VES	$37\pi^- N \to \eta'\pi^- N$

$a_2(1320)$ WIDTH

3π MODE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
$105.0^{+1.6}_{-1.9}$ OUR AVERAGE					
110 ± 2 $^{+2}_{-15}$	420k	ALEKSEEV 10	COMP		190 $\pi^- Pb \to \pi^-\pi^-\pi^+ Pb'$
108 ± 3 ±15		CHUNG 02	B852		18.3 $\pi^- p \to \pi^+\pi^-\pi^- p$
120 ±10		BARBERIS 98B			450 $pp \to p_f \pi^+\pi^-\pi^0 p_s$
105 ±10 ±11		ACCIARRI 97T	L3		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
120 ±10		ALBRECHT 97B	ARG		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
103.0± 6.0± 3.3	72.4k	AMELIN 96	VES		36 $\pi^- p \to \pi^+\pi^-\pi^0 n$
120 ±10		ARMSTRONG 90	OMEG	0	300.0 $pp \to pp\pi^+\pi^-\pi^0$

107.0± 9.7	4022	AUGUSTIN	89	DM2	±	$J/\psi \to \rho^{\pm} a_2^{\mp}$
118.5±12.5	3562	AUGUSTIN	89	DM2	0	$J/\psi \to \rho^0 a_2^0$
97 ± 5		[10] EVANGELIS...	81	OMEG	−	12 $\pi^- p \to 3\pi p$
96 ± 9	25k	[10] DAUM	80C	SPEC	−	63,94 $\pi^- p \to 3\pi p$
110 ±15	1097	[10] BALTAY	78B	HBC	+0	15 $\pi^+ p \to p 4\pi$
112 ±18	1.6k	[10] EMMS	75	DBC	0	4 $\pi^+ n \to p(3\pi)^0$
122 ±14	1.2k	[10,11] WAGNER	75	HBC	0	7 $\pi^+ p \to \Delta^{++}(3\pi)^0$
115 ±15		[10] ANTIPOV	73C	CNTR	−	25,40 $\pi^- p \to p \eta \pi^-$
99 ±15	1580	CHALOUPKA	73	HBC	−	3.9 $\pi^- p$
105 ± 5	28k	BOWEN	71	MMS	−	5 $\pi^- p$
99 ± 5	24k	BOWEN	71	MMS	+	5 $\pi^+ p$
103 ± 5	17k	BOWEN	71	MMS	−	7 $\pi^- p$

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

117 ± 6 ±20	18k	[12] SCHEGELSKY	06	RVUE	0	$\gamma\gamma \to \pi^+ \pi^- \pi^0$
120 ±40		CONDO	93	SHF		$\gamma p \to n \pi^+ \pi^+ \pi^-$
115 ±14	490	BALTAY	78B	HBC	0	15 $\pi^+ p \to \Delta 3\pi$
72 ±16	5k	BINNIE	71	MMS	−	$\pi^- p$ near a_2 threshold
79 ±12	941	ALSTON-...	70	HBC	+	7.0 $\pi^+ p \to 3\pi p$

[10] From a fit to $J^P = 2^+$ $\rho\pi$ partial wave.
[11] Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.
[12] From analysis of L3 data at 183–209 GeV.

$K\overline{K}$ AND $\eta\pi$ MODES

VALUE (MeV)	DOCUMENT ID
107 ±5 OUR ESTIMATE	
110.4±1.7 OUR AVERAGE	Includes data from the 2 datablocks that follow this one.

$K\overline{K}$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
The data in this block is included in the average printed for a previous datablock.						
109.8± 2.4 OUR AVERAGE						
112 ±20	4700	[13,14] CLELAND	82B	SPEC	+	50 $\pi^+ p \to K_S^0 K^+ p$
120 ±25	5200	[13,14] CLELAND	82B	SPEC	−	50 $\pi^- p \to K_S^0 K^- p$
106 ± 4	4000	CHABAUD	80	SPEC	−	17 $\pi^- A \to K_S^0 K^- A$
126 ±11	11000	CHABAUD	78	SPEC	−	9.8 $\pi^- p \to K^- K_S^0 p$
101 ± 8	4730	CHABAUD	78	SPEC	−	18.8 $\pi^- p \to K^- K_S^0 p$
113 ± 4		[13,15] MARTIN	78D	SPEC	−	10 $\pi^- p \to K_S^0 K^- p$
105 ± 8	2724	[15] MARGULIE	76	SPEC	−	23 $\pi^- p \to K^- K_S^0 p$
113 ±19	730	FOLEY	72	CNTR	−	20.3 $\pi^- p \to K^- K_S^0 p$
123 ±13	1500	[15] GRAYER	71	ASPK	−	17.2 $\pi^- p \to K^- K_S^0 p$

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

120 ±15	870	[16] SCHEGELSKY	06A	RVUE	0	$\gamma\gamma \to K_S^0 K_S^0$
121 ±51	1000	[13,14] CLELAND	82B	SPEC	+	30 $\pi^+ p \to K_S^0 K^+ p$
110 ±18	350	HYAMS	78	ASPK	+	12.7 $\pi^+ p \to K^+ K_S^0 p$

[13] From a fit to $J^P = 2^+$ partial wave.
[14] Number of events evaluated by us.
[15] Width errors enlarged by us to $4\Gamma/\sqrt{N}$; see the note with the $K^*(892)$ mass.
[16] From analysis of L3 data at 91 and 183–209 GeV.

$\eta\pi$ MODE

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
The data in this block is included in the average printed for a previous datablock.						
111.1± 2.4 OUR AVERAGE						
115 ±20		BARBERIS	00H			450 $pp \to p_f \eta\pi^0 p_s$
112 ±14		BARBERIS	00H			450 $pp \to \Delta_f^{++}\eta\pi^- p_s$
112 ± 3 ±2		[17] AMSLER	94D	CBAR		0.0 $\overline{p}p \to \pi^0\pi^0\eta$
103 ± 6 ±3		BELADIDZE	93	VES		$37\pi^- N \to \eta\pi^- N$
112.2± 5.7	2561	DELFOSSE	81	SPEC	+	$\pi^\pm p \to p\pi^\pm\eta$
116.6± 7.7	1653	DELFOSSE	81	SPEC	−	$\pi^\pm p \to p\pi^\pm\eta$
108 ± 9	1000	KEY	73	OSPK	−	6 $\pi^- p \to p\pi^-\eta$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
110 ± 4		ANISOVICH	09	RVUE		$\overline{p}p$, πN
127 ± 2 ±2		[18] THOMPSON	97	MPS		18 $\pi^- p \to \eta\pi^- p$
118 ±10		ARMSTRONG	93C	E760	0	$\overline{p}p \to \pi^0\eta\eta \to 6\gamma$
104 ± 9	6200	[19] CONFORTO	73	OSPK	−	6 $\pi^- p \to p MM^-$

[17] The systematic error of 2 MeV corresponds to the spread of solutions.
[18] Resolution is not unfolded.
[19] Missing mass with enriched $MMS = \eta\pi^-$, $\eta = 2\gamma$.

$\eta'\pi$ MODE

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
119±25 OUR AVERAGE				
140±35±20	IVANOV	01	B852	18 $\pi^- p \to \eta'\pi^- p$
106±32	BELADIDZE	93	VES	$37\pi^- N \to \eta'\pi^- N$

$a_2(1320)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	3π	(70.1 ±2.7) %	S=1.2
Γ_2	$\rho(770)\pi$		
Γ_3	$f_2(1270)\pi$		
Γ_4	$\rho(1450)\pi$		
Γ_5	$\eta\pi$	(14.5 ±1.2) %	
Γ_6	$\omega\pi\pi$	(10.6 ±3.2) %	S=1.3
Γ_7	$K\overline{K}$	(4.9 ±0.8) %	
Γ_8	$\eta'(958)\pi$	(5.3 ±0.9) $\times 10^{-3}$	
Γ_9	$\pi^\pm\gamma$	(2.68±0.31) $\times 10^{-3}$	
Γ_{10}	$\gamma\gamma$	(9.4 ±0.7) $\times 10^{-6}$	
Γ_{11}	e^+e^-	< 5 $\times 10^{-9}$	CL=90%

CONSTRAINED FIT INFORMATION

An overall fit to 5 branching ratios uses 18 measurements and one constraint to determine 4 parameters. The overall fit has a $\chi^2 =$ 9.3 for 15 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, $x_i \equiv \Gamma_i/\Gamma_{total}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_5	10		
x_6	−89	−46	
x_7	−1	−2	−24
	x_1	x_5	x_6

$a_2(1320)$ PARTIAL WIDTHS

$\Gamma(\eta\pi)$ — Γ_5

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •						
18.5±3.0	870	[20] SCHEGELSKY	06A	RVUE	0	$\gamma\gamma \rightarrow K^0_S K^0_S$

[20] From analysis of L3 data at 91 and 183–209 GeV, using $\Gamma(a_2(1320) \rightarrow \gamma\gamma) = 0.91$ keV and SU(3) relations.

$\Gamma(K\overline{K})$ — Γ_7

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$7.0^{+2.0}_{-1.5}$	870	[21] SCHEGELSKY	06A	RVUE	0	$\gamma\gamma \rightarrow K^0_S K^0_S$

[21] From analysis of L3 data at 91 and 183–209 GeV, using $\Gamma(a_2(1320) \rightarrow \gamma\gamma) = 0.91$ keV and SU(3) relations.

$\Gamma(\pi^\pm\gamma)$ — Γ_9

VALUE (keV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
287± 30 OUR AVERAGE						
284± 25±25	7100	MOLCHANOV	01	SELX		600 $\pi^- A \rightarrow \pi^+\pi^-\pi^- A$
295± 60		CIHANGIR	82	SPEC	+	200 π^+ A
• • • We do not use the following data for averages, fits, limits, etc. • • •						
461±110		[22] MAY	77	SPEC	±	9.7 γA

[22] Assuming one-pion exchange.

$\Gamma(\gamma\gamma)$ — Γ_{10}

VALUE (keV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1.00±0.06 OUR AVERAGE						
0.98±0.05±0.09		ACCIARRI	97T	L3		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
0.96±0.03±0.13		ALBRECHT	97B	ARG		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
1.26±0.26±0.18	36	BARU	90	MD1		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
1.00±0.07±0.15	415	BEHREND	90C	CELL	0	$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
1.03±0.13±0.21		BUTLER	90	MRK2		$e^+e^- \to e^+e^-\pi^+\pi^-\pi^0$
1.01±0.14±0.22	85	OEST	90	JADE		$e^+e^- \to e^+e^-\pi^0\eta$
0.90±0.27±0.15	56	[23] ALTHOFF	86	TASS	0	$e^+e^- \to e^+e^-3\pi$
1.14±0.20±0.26		[24] ANTREASYAN	86	CBAL	0	$e^+e^- \to e^+e^-\pi^0\eta$
1.06±0.18±0.19		BERGER	84C	PLUT	0	$e^+e^- \to e^+e^-3\pi$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$0.81\pm0.19^{+0.42}_{-0.11}$	35	[23] BEHREND	83B	CELL	0	$e^+e^- \to e^+e^-3\pi$
0.77±0.18±0.27	22	[24] EDWARDS	82F	CBAL	0	$e^+e^- \to e^+e^-\pi^0\eta$

[23] From $\rho\pi$ decay mode.
[24] From $\eta\pi^0$ decay mode.

$\Gamma(e^+e^-)$ — Γ_{11}

VALUE (eV)	CL%	DOCUMENT ID		TECN	COMMENT
< 0.56	90	ACHASOV	00K	SND	$e^+e^- \to \pi^0\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<25	90	VOROBYEV	88	ND	$e^+e^- \to \pi^0\eta$

$a_2(1320)$ $\Gamma(i)\Gamma(\gamma\gamma)/\Gamma(\text{total})$

$\Gamma(3\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_1\Gamma_{10}/\Gamma$

VALUE (keV)	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.65±0.02±0.02	18k	[25] SCHEGELSKY	06	RVUE	$\gamma\gamma \to \pi^+\pi^-\pi^0$

[25] From analysis of L3 data at 183–209 GeV.

$\Gamma(\eta\pi) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_5\Gamma_{10}/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.145^{+0.097}_{-0.034}$	[26] UEHARA	09A	BELL	$e^+e^- \to e^+e^-\eta\pi^0$

[26] From the D_2-wave. The fraction of the D_0-wave is $3.4^{+2.3}_{-1.1}$%.

$\Gamma(K\overline{K}) \times \Gamma(\gamma\gamma)/\Gamma_{total}$ — $\Gamma_7\Gamma_{10}/\Gamma$

VALUE (keV)	DOCUMENT ID		TECN	COMMENT
0.126±0.007±0.028	[27] ALBRECHT	90G	ARG	$e^+ e^- \rightarrow e^+ e^- K^+ K^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.081±0.006±0.027	[28] ALBRECHT	90G	ARG	$e^+ e^- \rightarrow e^+ e^- K^+ K^-$

[27] Using an incoherent background.
[28] Using a coherent background.

$a_2(1320)$ BRANCHING RATIOS

$\left[\Gamma(f_2(1270)\pi) + \Gamma(\rho(1450)\pi)\right]/\Gamma(\rho(770)\pi)$ — $(\Gamma_3+\Gamma_4)/\Gamma_2$

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.12	90	ABRAMOVI...	70B	HBC	−	3.93 $\pi^- p$

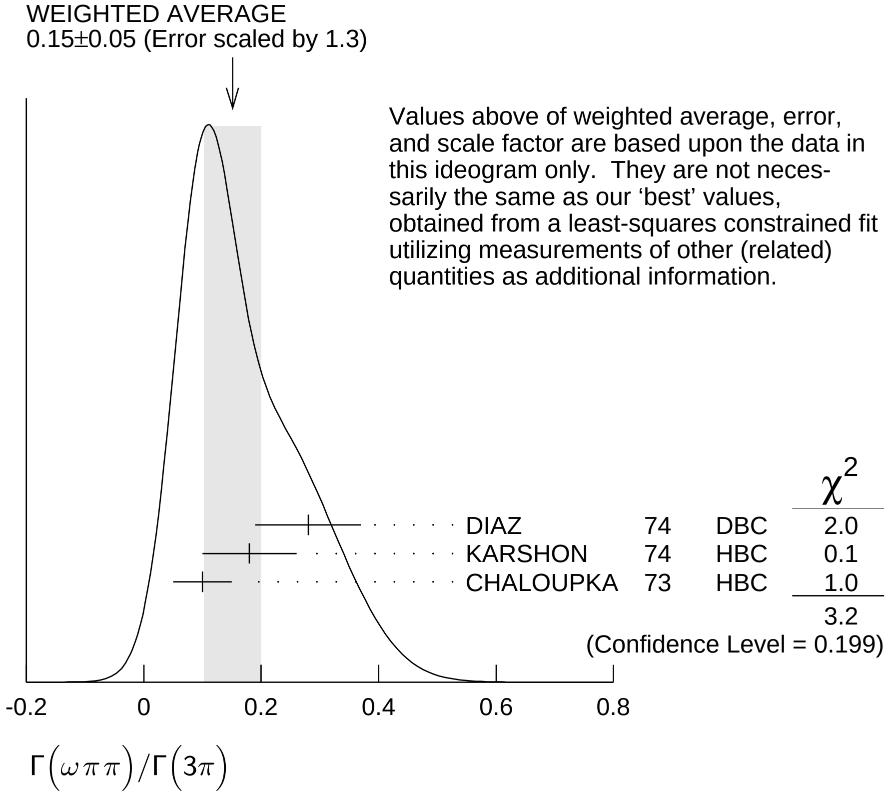
$\Gamma(\eta\pi)/\Gamma(3\pi)$ — Γ_5/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.207±0.018 OUR FIT						
0.213±0.020 OUR AVERAGE						
0.18 ±0.05		FORINO	76	HBC		11 $\pi^- p$
0.22 ±0.05	52	ANTIPOV	73	CNTR	−	40 $\pi^- p$
0.211±0.044	149	CHALOUPKA	73	HBC	−	3.9 $\pi^- p$
0.246±0.042	167	ALSTON-...	71	HBC	+	7.0 $\pi^+ p$
0.25 ±0.09	15	BOECKMANN	70	HBC	+	5.0 $\pi^+ p$
0.23 ±0.08	22	ASCOLI	68	HBC	−	5 $\pi^- p$
0.12 ±0.08		CHUNG	68	HBC	−	3.2 $\pi^- p$
0.22 ±0.09		CONTE	67	HBC	−	11.0 $\pi^- p$

$\Gamma(\omega\pi\pi)/\Gamma(3\pi)$ — Γ_6/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.15±0.05 OUR FIT Error includes scale factor of 1.3.						
0.15±0.05 OUR AVERAGE Error includes scale factor of 1.3. See the ideogram below.						
0.28±0.09	60	DIAZ	74	DBC	0	6 $\pi^+ n$
0.18±0.08		[29] KARSHON	74	HBC		Avg. of above two
0.10±0.05	279	CHALOUPKA	73	HBC	−	3.9 $\pi^- p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.29±0.08	140	[29] KARSHON	74	HBC	0	4.9 $\pi^+ p$
0.10±0.04	60	[29] KARSHON	74	HBC	+	4.9 $\pi^+ p$
0.19±0.08		DEFOIX	73	HBC	0	0.7 $\overline{p} p$

[29] KARSHON 74 suggest an additional $I = 0$ state strongly coupled to $\omega\pi\pi$ which could explain discrepancies in branching ratios and masses. We use a central value and a systematic spread.



$\Gamma(K\overline{K})/\Gamma(3\pi)$ — Γ_7/Γ_1

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.070±0.012 OUR FIT						
0.078±0.017		CHABAUD	78	RVUE		
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.011±0.003		[30] BERTIN	98B	OBLX		0.0 $\overline{p}p \to K^{\pm}K_S\pi^{\mp}$
0.056±0.014	50	[31] CHALOUPKA	73	HBC	−	3.9 $\pi^- p$
0.097±0.018	113	[31] ALSTON-...	71	HBC	+	7.0 $\pi^+ p$
0.06 ±0.03		[31] ABRAMOVI...	70B	HBC	−	3.93 $\pi^- p$
0.054±0.022		[31] CHUNG	68	HBC	−	3.2 $\pi^- p$

[30] Using 4π data from BERTIN 97D.
[31] Included in CHABAUD 78 review.

$\Gamma(K\overline{K})/\Gamma(\eta\pi)$ — Γ_7/Γ_5

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.08±0.02	[32] BERTIN	98B	OBLX	0.0 $\overline{p}p \to K^{\pm}K_S\pi^{\mp}$

[32] Using $\eta\pi\pi$ data from AMSLER 94D.

$\Gamma(\eta\pi)/[\Gamma(3\pi)+\Gamma(\eta\pi)+\Gamma(K\overline{K})]$ — $\Gamma_5/(\Gamma_1+\Gamma_5+\Gamma_7)$

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.162±0.012 OUR FIT						
0.140±0.028 OUR AVERAGE						
0.13 ±0.04		ESPIGAT	72	HBC	±	0.0 $\overline{p}p$
0.15 ±0.04	34	BARNHAM	71	HBC	+	3.7 $\pi^+ p$

$\Gamma(K\overline{K})/[\Gamma(3\pi)+\Gamma(\eta\pi)+\Gamma(K\overline{K})]$ — $\Gamma_7/(\Gamma_1+\Gamma_5+\Gamma_7)$

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.054±0.009 OUR FIT						
0.048±0.012 OUR AVERAGE						
0.05 ±0.02		TOET	73	HBC	+	5 $\pi^+ p$
0.09 ±0.04		TOET	73	HBC	0	5 $\pi^+ p$
0.03 ±0.02	8	DAMERI	72	HBC	−	11 $\pi^- p$
0.06 ±0.03	17	BARNHAM	71	HBC	+	3.7 $\pi^+ p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
0.020±0.004		[33] ESPIGAT	72	HBC	±	0.0 $\overline{p}p$

[33] Not averaged because of discrepancy between masses from $K\overline{K}$ and $\rho\pi$ modes.

$\Gamma(\eta'(958)\pi)/\Gamma_{total}$ — Γ_8/Γ

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.006	95	ALDE	92B	GAM2		38,100 $\pi^- p \to \eta' \pi^0 n$
<0.02	97	BARNHAM	71	HBC	+	3.7 $\pi^+ p$
0.004±0.004		BOESEBECK	68	HBC	+	8 $\pi^+ p$

$\Gamma(\eta'(958)\pi)/\Gamma(3\pi)$ — Γ_8/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.011	90	EISENSTEIN	73	HBC	−	5 $\pi^- p$
<0.04		ALSTON-...	71	HBC	+	7.0 $\pi^+ p$
$0.04\ ^{+0.03}_{-0.04}$		BOECKMANN	70	HBC	0	5.0 $\pi^+ p$

$\Gamma(\eta'(958)\pi)/\Gamma(\eta\pi)$ — Γ_8/Γ_5

VALUE	DOCUMENT ID		TECN	COMMENT
0.037±0.006 OUR AVERAGE				
0.032±0.009	ABELE	97C	CBAR	0.0 $\overline{p}p \to \pi^0\pi^0\eta'$
0.047±0.010±0.004	[34] BELADIDZE	93	VES	$37\pi^- N \to a_2^- N$
0.034±0.008±0.005	BELADIDZE	92	VES	$36\pi^- C \to a_2^- C$

[34] Using B($\eta' \to \pi^+\pi^-\eta$) = 0.441, B($\eta \to \gamma\gamma$) = 0.389 and B($\eta \to \pi^+\pi^-\pi^0$) = 0.236.

$\Gamma(\pi^\pm\gamma)/\Gamma_{total}$ — Γ_9/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$0.005^{+0.005}_{-0.003}$	[35] EISENBERG	72	HBC	4.3,5.25,7.5 γp

[35] Pion-exchange model used in this estimation.

$\Gamma(e^+e^-)/\Gamma_{total}$ — Γ_{11}/Γ

VALUE (units 10^{-9})	CL%	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<6	90	ACHASOV	00K	SND	$e^+e^- \to \pi^0\pi^0$

$a_2(1320)$ REFERENCES

ALEKSEEV 10 PRL 104 241803 M.G. Alekseev *et al.* (COMPASS Collab.)
ANISOVICH 09 IJMP A24 2481 V.V. Anisovich, A.V. Sarantsev
UEHARA 09A PR D80 032001 S. Uehara *et al.* (BELLE Collab.)
SCHEGELSKY 06 EPJ A27 199 V.A. Schegelsky *et al.*
SCHEGELSKY 06A EPJ A27 207 V.A. Schegelsky *et al.*
CHUNG 02 PR D65 072001 S.U. Chung *et al.* (BNL E852 Collab.)
IVANOV 01 PRL 86 3977 E.I. Ivanov *et al.* (BNL E852 Collab.)
MOLCHANOV 01 PL B521 171 V.V. Molchanov *et al.* (FNAL SELEX Collab.)
ACHASOV 00K PL B492 8 M.N. Achasov *et al.* (Novosibirsk SND Collab.)
BARBERIS 00H PL B488 225 D. Barberis *et al.* (WA 102 Collab.)
BARBERIS 98B PL B422 399 D. Barberis *et al.* (WA 102 Collab.)
BERTIN 98B PL B434 180 A. Bertin *et al.* (OBELIX Collab.)
ABELE 97C PL B404 179 A. Abele *et al.* (Crystal Barrel Collab.)
ACCIARRI 97T PL B413 147 M. Acciarri *et al.* (L3 Collab.)
ALBRECHT 97B ZPHY C74 469 H. Albrecht *et al.* (ARGUS Collab.)
THOMPSON 97 PRL 79 1630 D.R. Thompson *et al.* (BNL E852 Collab.)
AMELIN 96 ZPHY C70 71 D.V. Amelin *et al.* (SERP, TBIL)
AMSLER 94D PL B333 277 C. Amsler *et al.* (Crystal Barrel Collab.)
AOYAGI 93 PL B314 246 H. Aoyagi *et al.* (BKEI Collab.)
ARMSTRONG 93C PL B307 394 T.A. Armstrong *et al.* (FNAL, FERR, GENO+)
BELADIDZE 93 PL B313 276 G.M. Beladidze *et al.* (VES Collab.)
CONDO 93 PR D48 3045 G.T. Condo *et al.* (SLAC Hybrid Collab.)
ALDE 92B ZPHY C54 549 D.M. Alde *et al.* (SERP, BELG, LANL, LAPP+)
BELADIDZE 92 ZPHY C54 235 G.M. Beladidze *et al.* (VES Collab.)
ALBRECHT 90G ZPHY C48 183 H. Albrecht *et al.* (ARGUS Collab.)
ARMSTRONG 90 ZPHY C48 213 T.A. Armstrong, M. Benayoun, W. Beusch (WA76 Coll.)
BARU 90 ZPHY C48 581 S.E. Baru *et al.* (MD-1 Collab.)
BEHREND 90C ZPHY C46 583 H.J. Behrend *et al.* (CELLO Collab.)
BUTLER 90 PR D42 1368 F. Butler *et al.* (Mark II Collab.)
OEST 90 ZPHY C47 343 T. Oest *et al.* (JADE Collab.)
AUGUSTIN 89 NP B320 1 J.E. Augustin, G. Cosme (DM2 Collab.)
VOROBYEV 88 SJNP 48 273 P.V. Vorobiev *et al.* (NOVO)
Translated from YAF 48 436.
ALTHOFF 86 ZPHY C31 537 M. Althoff *et al.* (TASSO Collab.)
ANTREASYAN 86 PR D33 1847 D. Antreasyan *et al.* (Crystal Ball Collab.)
BERGER 84C PL 149B 427 C. Berger *et al.* (PLUTO Collab.)
BEHREND 83B PL 125B 518 (erratum) H.J. Behrend *et al.* (CELLO Collab.)
CIHANGIR 82 PL 117B 123 S. Cihangir *et al.* (FNAL, MINN, ROCH)
CLELAND 82B NP B208 228 W.E. Cleland *et al.* (DURH, GEVA, LAUS+)
EDWARDS 82F PL 110B 82 C. Edwards *et al.* (CIT, HARV, PRIN+)
DELFOSSE 81 NP B183 349 A. Delfosse *et al.* (GEVA, LAUS)
EVANGELIS... 81 NP B178 197 C. Evangelista *et al.* (BARI, BONN, CERN+)
CHABAUD 80 NP B175 189 V. Chabaud *et al.* (CERN, MPIM, AMST)
DAUM 80C PL 89B 276 C. Daum *et al.* (AMST, CERN, CRAC, MPIM+) JP
BALTAY 78B PR D17 62 C. Baltay *et al.* (COLU, BING)
CHABAUD 78 NP B145 349 V. Chabaud *et al.* (CERN, MPIM)
FERRERSORIA 78 PL 74B 287 A. Ferrer Soria *et al.* (ORSAY, CERN, CDEF+)
HYAMS 78 NP B146 303 B.D. Hyams *et al.* (CERN, MPIM, ATEN)
MARTIN 78D PL 74B 417 A.D. Martin *et al.* (DURH, GEVA) JP
MAY 77 PR D16 1983 E.N. May *et al.* (ROCH, CORN)
FORINO 76 NC 35A 465 A. Forino *et al.* (BGNA, FIRZ, GENO, MILA+)
MARGULIE 76 PR D14 667 M. Margulies *et al.* (BNL, CUNY)
EMMS 75 PL 58B 117 M.J. Emms *et al.* (BIRM, DURH, RHEL) JP
WAGNER 75 PL 58B 201 F. Wagner, M. Tabak, D.M. Chew (LBL) JP
DIAZ 74 PRL 32 260 J. Diaz *et al.* (CASE, CMU)
KARSHON 74 PRL 32 852 U. Karshon *et al.* (REHO)
ANTIPOV 73 NP B63 175 Y.M. Antipov *et al.* (CERN, SERP) JP
ANTIPOV 73C NP B63 153 Y.M. Antipov *et al.* (CERN, SERP) JP
CHALOUPKA 73 PL 44B 211 V. Chaloupka *et al.* (CERN)
CONFORTO 73 PL 45B 154 G. Conforto *et al.* (EFI, FNAL, TNTO+)
DEFOIX 73 PL 43B 141 C. Defoix *et al.* (CDEF)
EISENSTEIN 73 PR D7 278 L. Eisenstein *et al.* (ILL)
KEY 73 PRL 30 503 A.W. Key *et al.* (TNTO, EFI, FNAL, WISC)
TOET 73 NP B63 248 D.Z. Toet *et al.* (NIJM, BONN, DURH, TORI)
DAMERI 72 NC 9A 1 M. Dameri *et al.* (GENO, MILA, SACL)
EISENBERG 72 PR D5 15 Y. Eisenberg *et al.* (REHO, SLAC, TELA)
ESPIGAT 72 NP B36 93 P. Espigat *et al.* (CERN, CDEF)
FOLEY 72 PR D6 747 K.J. Foley *et al.* (BNL, CUNY)

ALSTON-...	71	PL 34B 156	M. Alston-Garnjost *et al.*	(LRL)
BARNHAM	71	PRL 26 1494	K.W.J. Barnham *et al.*	(LBL)
BINNIE	71	PL 36B 257	D.M. Binnie *et al.*	(LOIC, SHMP)
BOWEN	71	PRL 26 1663	D.R. Bowen *et al.*	(NEAS, STON)
GRAYER	71	PL 34B 333	G. Grayer *et al.*	(CERN, MPIM)
ABRAMOVI...	70B	NP B23 466	M. Abramovich *et al.*	(CERN) JP
ALSTON-...	70	PL 33B 607	M. Alston-Garnjost *et al.*	(LRL)
BOECKMANN	70	NP B16 221	K. Boeckmann *et al.*	(BONN, DURH, NIJM+)
ASCOLI	68	PRL 20 1321	G. Ascoli *et al.*	(ILL) JP
BOESEBECK	68	NP B4 501	K. Boesebeck *et al.*	(AACH, BERL, CERN)
CHUNG	68	PR 165 1491	S.U. Chung *et al.*	(LRL)
CONTE	67	NC 51A 175	F. Conte *et al.*	(GENO, HAMB, MILA, SACL)