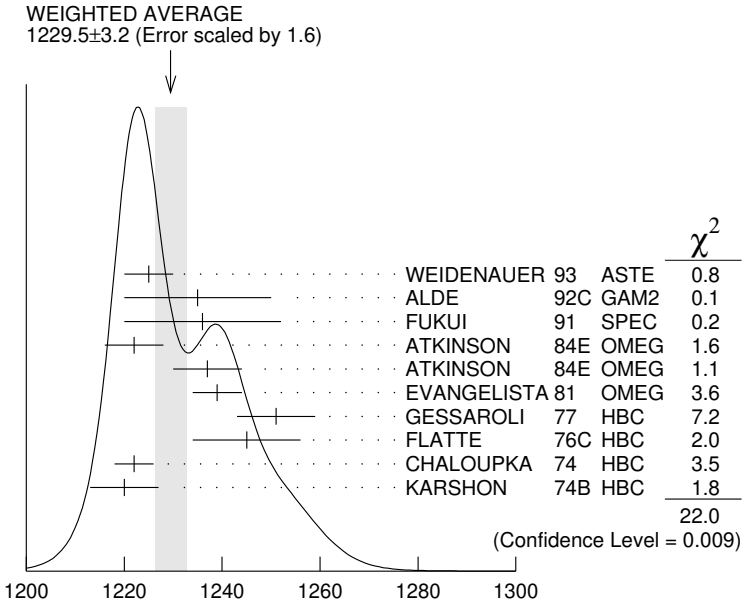
$b_1(1235)$

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

$b_1(1235)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
1229.5± 3.2 OUR AVERAGE		Error includes scale factor of 1.6. See the ideogram below.				
1225 ± 5		WEIDENAUER	93	ASTE		$\overline{p}p \to 2\pi^+ 2\pi^- \pi^0$
1235 ±15		ALDE	92C	GAM2		38,100 $\pi^- p \to \omega\pi^0 n$
1236 ±16		FUKUI	91	SPEC		8.95 $\pi^- p \to \omega\pi^0 n$
1222 ± 6		ATKINSON	84E	OMEG	±	25–55 $\gamma p \to \omega\pi X$
1237 ± 7		ATKINSON	84E	OMEG	0	25–55 $\gamma p \to \omega\pi X$
1239 ± 5		EVANGELISTA	81	OMEG	−	12 $\pi^- p \to \omega\pi p$
1251 ± 8	450	GESSAROLI	77	HBC	−	11 $\pi^- p \to \pi^- \omega p$
1245 ±11	890	FLATTE	76C	HBC	−	4.2 $K^- p \to \pi^- \omega \Sigma^+$
1222 ± 4	1400	CHALOUPKA	74	HBC	−	3.9 $\pi^- p$
1220 ± 7	600	KARSHON	74B	HBC	+	4.9 $\pi^+ p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1190 ±10		AUGUSTIN	89	DM2	±	$e^+ e^- \to 5\pi$
1213 ± 5		ATKINSON	84C	OMEG	0	20–70 γp
1271 ±11		COLLICK	84	SPEC	+	200 $\pi^+ Z \to Z\pi\omega$



$b_1(1235)$ mass (MeV)

$b_1(1235)$ WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
142± 9 OUR AVERAGE	Error includes scale factor of 1.2.					
113±12		WEIDENAUER	93	ASTE		$\overline{p}p \to 2\pi^+ 2\pi^- \pi^0$
160±30		ALDE	92C	GAM2		38,100 $\pi^- p \to \omega\pi^0 n$
151±31		FUKUI	91	SPEC		8.95 $\pi^- p \to \omega\pi^0 n$
170±15		EVANGELISTA	81	OMEG	−	12 $\pi^- p \to \omega\pi p$
170±50	225	BALTAY	78B	HBC	+	15 $\pi^+ p \to p4\pi$
155±32	450	GESSAROLI	77	HBC	−	11 $\pi^- p \to \pi^- \omega p$
182±45	890	FLATTE	76C	HBC	−	4.2 $K^- p \to \pi^- \omega \Sigma^+$
135±20	1400	CHALOUPKA	74	HBC	−	3.9 $\pi^- p$
156±22	600	KARSHON	74B	HBC	+	4.9 $\pi^+ p$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
210±19		AUGUSTIN	89	DM2	±	$e^+ e^- \to 5\pi$
231±14		ATKINSON	84C	OMEG	0	20–70 γp
232±29		COLLICK	84	SPEC	+	200 $\pi^+ Z \to Z\pi\omega$

$b_1(1235)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1	$\omega\pi$ [D/S amplitude ratio $= 0.29 \pm 0.04$]	dominant	
Γ_2	$\pi^\pm\gamma$	$(1.6\pm0.4)\times10^{-3}$	
Γ_3	$\eta\rho$	seen	
Γ_4	$\pi^+\pi^+\pi^-\pi^0$	< 50 %	84%
Γ_5	$(K\overline{K})^\pm\pi^0$	< 8 %	90%
Γ_6	$K^0_S K^0_L \pi^\pm$	< 6 %	90%
Γ_7	$K^0_S K^0_S \pi^\pm$	< 2 %	90%
Γ_8	$\phi\pi$	< 1.5 %	84%

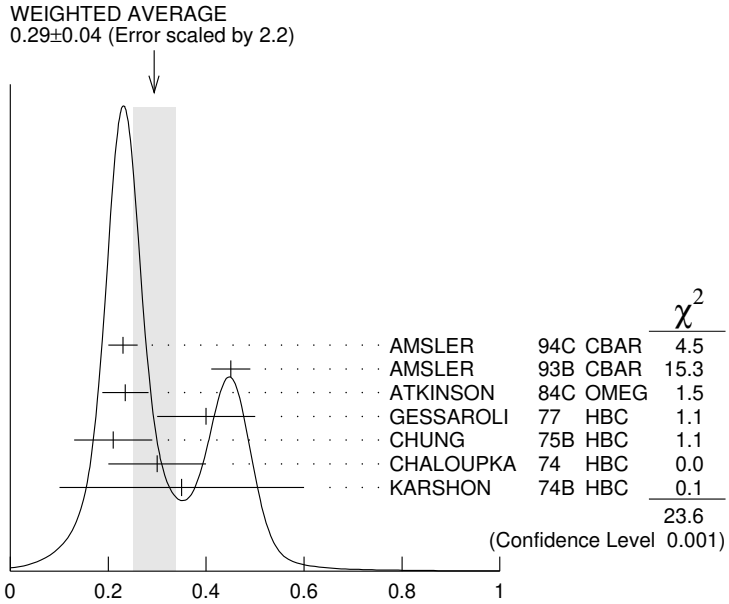
$b_1(1235)$ PARTIAL WIDTHS

$\Gamma(\pi^\pm\gamma)$ — Γ_2

VALUE (keV)	DOCUMENT ID		TECN	CHG	COMMENT
230±60	COLLICK	84	SPEC	+	200 π^+ Z → Z $\pi\omega$

$b_1(1235)$ D-wave/S-wave AMPLITUDE RATIO IN DECAY OF $b_1(1235) \to \omega\pi$

VALUE	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
0.29 ±0.04 OUR AVERAGE		Error includes scale factor of 2.2. See the ideogram below.				
0.23 ±0.03		AMSLER	94C	CBAR		0.0 $\overline{p}p \to \omega\eta\pi^0$
0.45 ±0.04		AMSLER	93B	CBAR		0.0 $\overline{p}p \to \omega\pi^0\pi^0$
0.235±0.047		ATKINSON	84C	OMEG		20–70 γp
$0.4 \; {}^{+0.1}_{-0.1}$		GESSAROLI	77	HBC	−	11 $\pi^- p \to \pi^-\omega p$
0.21 ±0.08		CHUNG	75B	HBC	+	7.1 $\pi^+ p$
0.3 ±0.1		CHALOUPKA	74	HBC	−	3.9–7.5 $\pi^- p$
0.35 ±0.25	600	KARSHON	74B	HBC	+	4.9 $\pi^+ p$



$b_1(1235)$ D-wave/S-wave amplitude ratio in decay of $b_1(1235) \rightarrow \omega\pi$

$b_1(1235)$ BRANCHING RATIOS

$\Gamma(\eta\rho)/\Gamma(\omega\pi)$ — Γ_3/Γ_1

VALUE	DOCUMENT ID		TECN	COMMENT
<0.10	ATKINSON	84D	OMEG	20–70 $\gamma\ p$

$\Gamma(\pi^+\pi^+\pi^-\pi^0)/\Gamma(\omega\pi)$ — Γ_4/Γ_1

VALUE	DOCUMENT ID		TECN	CHG	COMMENT
<0.5	ABOLINS	63	HBC	+	3.5 $\pi^+\ p$

$\Gamma((K\overline{K})^\pm\pi^0)/\Gamma(\omega\pi)$ — Γ_5/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.08	90	BALTAY	67	HBC	±	0.0 $\overline{p}p$

$\Gamma(K^0_S K^0_L \pi^\pm)/\Gamma(\omega\pi)$ — Γ_6/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.06	90	BALTAY	67	HBC	±	0.0 $\overline{p}p$

$\Gamma(K^0_S K^0_S \pi^\pm)/\Gamma(\omega\pi)$ — Γ_7/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.02	90	BALTAY	67	HBC	±	0.0 $\overline{p}p$

$\Gamma(\phi\pi)/\Gamma(\omega\pi)$ — Γ_8/Γ_1

VALUE	CL%	DOCUMENT ID		TECN	CHG	COMMENT
<0.004	95	VIKTOROV	96	SPEC	0	32.5 $\pi^- p \to K^+ K^- \pi^0 n$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<0.04	95	BIZZARRI	69	HBC	±	0.0 $\overline{p}p$
<0.015		DAHL	67	HBC		1.6–4.2 $\pi^- p$

$b_1(1235)$ REFERENCES

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AMSLER	94C	PL B327 425	C. Amsler et al.	(Crystal Barrel Collab.)
AMSLER	93B	PL B311 362	C. Amsler et al.	(Crystal Barrel Collab.)
WEIDENAUER	93	ZPHY C59 387	P. Weidenauer et al.	(ASTERIX Collab.)
ALDE	92C	ZPHY C54 553	D.M. Alde et al.	(BELG, SERP, KEK, LANL+)
FUKUI	91	PL B257 241	S. Fukui et al.	(SUGI, NAGO, KEK, KYOT+)
AUGUSTIN	89	NP B320 1	J.E. Augustin, G. Cosme	(DM2 Collab.)
ATKINSON	84C	NP B243 1	M. Atkinson et al.	(BONN, CERN, GLAS+) JP
ATKINSON	84D	NP B242 269	M. Atkinson et al.	(BONN, CERN, GLAS+)
ATKINSON	84E	PL 138B 459	M. Atkinson et al.	(BONN, CERN, GLAS+)
COLLICK	84	PRL 53 2374	B. Collick et al.	(MINN, ROCH, FNAL)
EVANGELISTA	81	NP B178 197	C. Evangelista et al.	(BARI, BONN, CERN+)
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GESSAROLI	77	NP B126 382	R. Gessaroli et al.	(BGNA, FIRZ, GENO+) JP
FLATTE	76C	PL 64B 225	S.M. Flatte et al.	(CERN, AMST, NIJM+) JP
CHUNG	75B	PR D11 2426	S.U. Chung et al.	(BNL, LBL, UCSC) JP
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CARMONY	64	PRL 12 254	D.D. Carmony et al.	(UCB) JP
BONDAR	63B	PL 5 209	L. Bondar et al.	(AACH, BIRM, HAMB, LOIC+)