$\rho_3(2250)$

$I^G(J^{PC}) = 1^+(3^{--})$

OMITTED FROM SUMMARY TABLE

Contains results mostly from formation experiments. For further production experiments see the Further States entry. See also $\rho(2150)$, $f_2(2150)$, $f_4(2300)$, $\rho_5(2350)$.

$\rho_3(2250)$ MASS

$\overline{p}p \to \pi\pi$ or $K\overline{K}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$2248 \pm 17 ^{+59}_{-5}$	1.8k	[1] ABLIKIM	20F	BES3		$\psi(2S) \to K^+K^-\eta$
~ 2232		HASAN	94	RVUE		$\overline{p}p \to \pi\pi$
~ 2090		[2] OAKDEN	94	RVUE		0.36–1.55 $\overline{p}p \to \pi\pi$
~ 2250		[3] MARTIN	80B	RVUE		
~ 2300		[3] MARTIN	80C	RVUE		
~ 2140		[4] CARTER	78B	CNTR	0	0.7–2.4 $\overline{p}p \to K^-K^+$
~ 2150		[5] CARTER	77	CNTR	0	0.7–2.4 $\overline{p}p \to \pi\pi$

[1] Seen in $\psi(2S)$ decay with branching ratio $\psi(2S) \to X\eta \to K^+K^-\eta = (1.9 \pm 0.4^{+0.5}_{-1.3}) \times 10^{-6}$.
[2] See however KLOET 96 who fit $\pi^+\pi^-$ only and find waves only up to $J = 3$ to be important but not significantly resonant.
[3] $I(J^P) = 1(3^-)$ from simultaneous analysis of $p\overline{p} \to \pi^-\pi^+$ and $\pi^0\pi^0$.
[4] $I = 0, 1$. $J^P = 3^-$ from Barrelet-zero analysis.
[5] $I(J^P) = 1(3^-)$ from amplitude analysis.

S-CHANNEL $\overline{N}N$

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2260 ± 20	[6] ANISOVICH	02	SPEC		0.6–1.9 $p\overline{p} \to \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$
~ 2190	[7] CUTTS	78B	CNTR		0.97–3 $\overline{p}p \to \overline{N}N$
2155 ± 15	[7,8] COUPLAND	77	CNTR	0	0.7–2.4 $\overline{p}p \to \overline{p}p$
2193 ± 2	[7,9] ALSPECTOR	73	CNTR		$\overline{p}p$ S channel
2190 ± 10	[10] ABRAMS	70	CNTR		S channel $\overline{p}N$

[6] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.
[7] Isospins 0 and 1 not separated.
[8] From a fit to the total elastic cross section.
[9] Referred to as T or T region by ALSPECTOR 73.
[10] Seen as bump in $I = 1$ state. See also COOPER 68. PEASLEE 75 confirm $\overline{p}p$ results of ABRAMS 70, no narrow structure.

Other processes

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$2290 \pm 20 \pm 30$	AMELIN	00	VES	37 $\pi^-p \to \eta\pi^+\pi^-n$

$\rho_3(2250)$ WIDTH

$\overline{p}p \to \pi\pi$ or $K\overline{K}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$185^{+31}_{-26}{}^{+17}_{-103}$	1.8k	[11] ABLIKIM	20F	BES3		$\psi(2S) \to K^+K^-\eta$
~ 220		HASAN	94	RVUE		$\overline{p}p \to \pi\pi$
~ 60		[12] OAKDEN	94	RVUE		0.36–1.55 $\overline{p}p \to \pi\pi$
~ 250		[13] MARTIN	80B	RVUE		
~ 200		[13] MARTIN	80C	RVUE		
~ 150		[14] CARTER	78B	CNTR	0	0.7–2.4 $\overline{p}p \to K^-K^+$
~ 200		[15] CARTER	77	CNTR	0	0.7–2.4 $\overline{p}p \to \pi\pi$

[11] Seen in $\psi(2S)$ decay with branching ratio $\psi(2S) \to X\eta \to K^+K^-\eta = (1.9 \pm 0.4^{+0.5}_{-1.3}) \times 10^{-6}$.

[12] See however KLOET 96 who fit $\pi^+\pi^-$ only and find waves only up to $J = 3$ to be important but not significantly resonant.

[13] $I(J^P) = 1(3^-)$ from simultaneous analysis of $p\overline{p} \to \pi^-\pi^+$ and $\pi^0\pi^0$.

[14] $I = 0$, 1. $J^P = 3^-$ from Barrelet-zero analysis.

[15] $I(J^P) = 1(3^-)$ from amplitude analysis.

S-CHANNEL $\overline{N}N$

VALUE (MeV)	DOCUMENT ID		TECN	CHG	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
160 ± 25	[16] ANISOVICH	02	SPEC		0.6–1.9 $p\overline{p} \to \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$
135 ± 75	[17,18] COUPLAND	77	CNTR	0	0.7–2.4 $\overline{p}p \to \overline{p}p$
98 ± 8	[18] ALSPECTOR	73	CNTR		$\overline{p}p$ S channel
~ 85	[19] ABRAMS	70	CNTR		S channel $\overline{p}N$

[16] From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.

[17] From a fit to the total elastic cross section.

[18] Isospins 0 and 1 not separated.

[19] Seen as bump in $I = 1$ state. See also COOPER 68. PEASLEE 75 confirm $\overline{p}p$ results of ABRAMS 70, no narrow structure.

Other processes

VALUE (MeV)	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$230 \pm 50 \pm 80$	AMELIN	00	VES	37 $\pi^-p \to \eta\pi^+\pi^-n$

$\rho_3(2250)$ REFERENCES

ABLIKIM	20F	PR D101 032008	M. Ablikim et al.	(BESIII Collab.)
ANISOVICH	02	PL B542 8	A.V. Anisovich et al.	
ANISOVICH	01D	PL B508 6	A.V. Anisovich et al.	
ANISOVICH	01E	PL B513 281	A.V. Anisovich et al.	
AMELIN	00	NP A668 83	D. Amelin et al.	(VES Collab.)
ANISOVICH	00J	PL B491 47	A.V. Anisovich et al.	(RAL, LOQM, PNPI+)
KLOET	96	PR D53 6120	W.M. Kloet, F. Myhrer	(RUTG, NORD)
HASAN	94	PL B334 215	A. Hasan, D.V. Bugg	(LOQM)
OAKDEN	94	NP A574 731	M.N. Oakden, M.R. Pennington	(DURH)
MARTIN	80B	NP B176 355	B.R. Martin, D. Morgan	(LOUC, RHEL) JP

MARTIN	80C	NP B169 216	A.D. Martin, M.R. Pennington	(DURH) JP
CARTER	78B	NP B141 467	A.A. Carter	(LOQM)
CUTTS	78B	PR D17 16	D. Cutts *et al.*	(STON, WISC)
CARTER	77	PL 67B 117	A.A. Carter *et al.*	(LOQM, RHEL) JP
COUPLAND	77	PL 71B 460	M. Coupland *et al.*	(LOQM, RHEL)
PEASLEE	75	PL 57B 189	D.C. Peaslee *et al.*	(CANB, BARI, BROW+)
ALSPECTOR	73	PRL 30 511	J. Alspector *et al.*	(RUTG, UPNJ)
ABRAMS	70	PR D1 1917	R.J. Abrams *et al.*	(BNL)
COOPER	68	PRL 20 1059	W.A. Cooper *et al.*	(ANL)