NODE=M044

$\rho_3(2250)$

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

OMITTED FROM SUMMARY TABLE

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

NODE=M044

$\rho_3(2250)$ MASS

NODE=M044205

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

NODE=M044M1
NODE=M044M1

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		$\psi(2S) \rightarrow K^+K^-\eta$
~ 2232		HASAN	94	RVUE		$\overline{p}p \rightarrow \pi\pi$
~ 2090		[2] OAKDEN	94	RVUE		0.36–1.55 $\overline{p}p \rightarrow \pi\pi$
~ 2250		[3] MARTIN	80B	RVUE		
~ 2300		[3] MARTIN	80C	RVUE		
~ 2140		[4] CARTER	78B	CNTR	0	0.7–2.4 $\overline{p}p \rightarrow K^-K^+$
~ 2150		[5] CARTER	77	CNTR	0	0.7–2.4 $\overline{p}p \rightarrow \pi\pi$

[1] Seen in $\psi(2S)$ decay with branching ratio $\psi(2S) \rightarrow X\eta \rightarrow K^+K^-\eta = (1.9 \pm 0.4^{+0.5}_{-1.3}) \times 10^{-6}$.
NODE=M044M1;LINKAGE=A

[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.
NODE=M044M1;LINKAGE=CC

[3] $I(J^P) = 1(3^-)$ from simultaneous analysis of $p\overline{p} \rightarrow \pi^-\pi^+$ and $\pi^0\pi^0$.
NODE=M044M1;LINKAGE=P

[4] $I = 0, 1$. $J^P = 3^-$ from Barrelet-zero analysis.
NODE=M044M1;LINKAGE=K

[5] $I(J^P) = 1(3^-)$ from amplitude analysis.
NODE=M044M1;LINKAGE=J

S-CHANNEL $\overline{N}N$

NODE=M044M2
NODE=M044M2

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 $p\overline{p} \rightarrow \omega\pi^0$, $\omega\eta\pi^0$, $\pi^+\pi^-$
~ 2190	[7] CUTTS	78B	CNTR		0.97–3 $\overline{p}p \rightarrow \overline{N}N$
2155 ± 15	[7,8] COUPLAND	77	CNTR	0	0.7–2.4 $\overline{p}p \rightarrow \overline{p}p$
$2193 \pm\ 2$	[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.
NODE=M044M;LINKAGE=AY

[7] Isospins 0 and 1 not separated.
NODE=M044M2;LINKAGE=I

[8] From a fit to the total elastic cross section.
NODE=M044M2;LINKAGE=E

[9] Referred to as *T* or *T* region by ALSPECTOR 73.
NODE=M044M2;LINKAGE=M

[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.
NODE=M044M2;LINKAGE=B

Other processes

NODE=M044M3
NODE=M044M3

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 $\pi^-p \rightarrow \eta\pi^+\pi^-n$

$\rho_3(2250)$ WIDTH

NODE=M044210

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

NODE=M044W1
NODE=M044W1

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		$\psi(2S) \rightarrow K^+K^-\eta$
~ 220		HASAN	94	RVUE		$\overline{p}p \rightarrow \pi\pi$
$\sim\ 60$		[12] OAKDEN	94	RVUE		0.36–1.55 $\overline{p}p \rightarrow \pi\pi$
~ 250		[13] MARTIN	80B	RVUE		
~ 200		[13] MARTIN	80C	RVUE		
~ 150		[14] CARTER	78B	CNTR	0	0.7–2.4 $\overline{p}p \rightarrow K^-K^+$
~ 200		[15] CARTER	77	CNTR	0	0.7–2.4 $\overline{p}p \rightarrow \pi\pi$

[11] Seen in $\psi(2S)$ decay with branching ratio $\psi(2S) \to X\eta \to K^+K^-\eta = (1.9 \pm 0.4^{+0.5}_{-1.3}) \times 10^{-6}$. NODE=M044W1;LINKAGE=A

[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. NODE=M044W1;LINKAGE=CC

[13] $I(J^P) = 1(3^-)$ from simultaneous analysis of $p\overline{p} \to \pi^-\pi^+$ and $\pi^0\pi^0$. NODE=M044W1;LINKAGE=P

[14] $I = 0, 1$. $J^P = 3^-$ from Barrelet-zero analysis. NODE=M044W1;LINKAGE=K

[15] $I(J^P) = 1(3^-)$ from amplitude analysis. NODE=M044W1;LINKAGE=J

S-CHANNEL $\overline{N}N$

NODE=M044W2
NODE=M044W2

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. NODE=M044W;LINKAGE=AY

[17] From a fit to the total elastic cross section. NODE=M044W2;LINKAGE=E

[18] Isospins 0 and 1 not separated. NODE=M044W2;LINKAGE=I

[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. NODE=M044W2;LINKAGE=B

Other processes

NODE=M044W3
NODE=M044W3

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

ρ_3(2250) REFERENCES

NODE=M044

ABLIKIM	20F	PR D101 032008	M. Ablikim *et al.*	(BESIII Collab.)	REFID=60256
ANISOVICH	02	PL B542 8	A.V. Anisovich *et al.*		REFID=48828
ANISOVICH	01D	PL B508 6	A.V. Anisovich *et al.*		REFID=48327
ANISOVICH	01E	PL B513 281	A.V. Anisovich *et al.*		REFID=48349
AMELIN	00	NP A668 83	D. Amelin *et al.*	(VES Collab.)	REFID=47432
ANISOVICH	00J	PL B491 47	A.V. Anisovich *et al.*	(RAL, LOQM, PNPI+)	REFID=47950
KLOET	96	PR D53 6120	W.M. Kloet, F. Myhrer	(RUTG, NORD)	REFID=45212
HASAN	94	PL B334 215	A. Hasan, D.V. Bugg	(LOQM)	REFID=44103
OAKDEN	94	NP A574 731	M.N. Oakden, M.R. Pennington	(DURH)	REFID=45210
MARTIN	80B	NP B176 355	B.R. Martin, D. Morgan	(LOUC, RHEL) JP	REFID=21838
MARTIN	80C	NP B169 216	A.D. Martin, M.R. Pennington	(DURH) JP	REFID=21837
CARTER	78B	NP B141 467	A.A. Carter	(LOQM)	REFID=21964
CUTTS	78B	PR D17 16	D. Cutts *et al.*	(STON, WISC)	REFID=21733
CARTER	77	PL 67B 117	A.A. Carter *et al.*	(LOQM, RHEL) JP	REFID=21963
COUPLAND	77	PL 71B 460	M. Coupland *et al.*	(LOQM, RHEL)	REFID=21830
PEASLEE	75	PL 57B 189	D.C. Peaslee *et al.*	(CANB, BARI, BROW+)	REFID=21824
ALSPECTOR	73	PRL 30 511	J. Alspector *et al.*	(RUTG, UPNJ)	REFID=21813
ABRAMS	70	PR D1 1917	R.J. Abrams *et al.*	(BNL)	REFID=21807
COOPER	68	PRL 20 1059	W.A. Cooper *et al.*	(ANL)	REFID=21805