$$\rho_{3}(2250)$$

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

OMITTED FROM SUMMARY TABLE

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

ρ₃(2250) MASS

$\overline{p}p \rightarrow \pi\pi \text{ or } k$	(<u>K</u>					
VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
ullet $ullet$ We do not use the following data for averages, fits, limits, etc. $ullet$ $ullet$						
$2248 {\pm} 17 {+59 \atop -5}$	1.8k	¹ ABLIKIM	20F	BES3		$\psi(2S) \rightarrow K^+ K^- \eta$
\sim 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	80 B	RVUE		
~ 2300		³ MARTIN	80C	RVUE		
~ 2140		⁴ CARTER	78 B	CNTR	0	$0.7-2.4 \overline{p}p \rightarrow K^- K^+$
~ 2150		⁵ CARTER	77	CNTR	0	$0.72.4 \ \overline{p} p \rightarrow \pi \pi$
¹ Seen in $\psi(2S)$ 0.4 $\substack{+0.5\\-1.3}$ × 10) decay v) ^{—6} .	with branching ra	tio ψ ($(2S) \rightarrow$	Xη	$\rightarrow K^+ K^- \eta = (1.9 \pm$
² See however H important but ³ $I(J^P) = 1(3^{-1})^{-1}$ ⁴ $I = 0, 1. J^P$ ⁵ $I(J^P) = 1(3^{-1})^{-1}$	(LOET 9 not signif) from sig = 3 ⁻ from) from ar	6 who fit $\pi^+\pi^-$ ficantly resonant. multaneous analys m Barrelet-zero ar nplitude analysis.	only a is of µ alysis	and find $\overline{p} ightarrow \pi$	waves $-\pi^+$	s only up to $J = 3$ to be and $\pi^0 \pi^0$.
SCHANNEL A	ĪN					
S-CHANNEL A	I N	DOCUMENT ID		TECN	CHG	COMMENT
S-CHANNEL A VALUE (MeV) ••• We do not	use the fo	<u>DOCUMENT ID</u> Illowing data for a	verage	<u>TECN</u> es, fits, li	<u>CHG</u> imits, e	<u>COMMENT</u> etc. ● ● ●
S-CHANNEL A <u>VALUE (MeV)</u> • • • We do not 2260±20	USE the fo	DOCUMENT ID Illowing data for a ⁶ ANISOVICH	verage 02	<u>TECN</u> es, fits, li SPEC	<u>CHG</u> imits, o	$\underbrace{COMMENT}_{\text{etc.}} \bullet \bullet \bullet$ $0.6-1.9 \ p \overline{p} \to \omega \pi^{0},$ $\omega n \pi^{0} \ \pi^{+} \pi^{-}$
S-CHANNEL $\overline{\mathbf{A}}$ VALUE (MeV) ••• We do not 2260 \pm 20 ~ 2190	N use the fo	DOCUMENT ID Illowing data for a ⁶ ANISOVICH ⁷ CUTTS	verage 02 78B	<u>TECN</u> es, fits, li SPEC CNTR	<u>CHG</u> imits, o	COMMENT etc. • • • $0.6-1.9 \ p\overline{p} \rightarrow \omega \pi^{0}, \qquad \qquad$
S-CHANNEL $\overline{\mathbf{A}}$ $\underline{VALUE (MeV)}$ ••• We do not 2260 ± 20 ~ 2190 2155 ± 15	USE the fo	DOCUMENT ID Illowing data for a ⁶ ANISOVICH ⁷ CUTTS ^{7,8} COUPLAND	verage 02 78B 77	<u>TECN</u> es, fits, li SPEC CNTR CNTR	<u>CHG</u> imits, o	COMMENT etc. • • • $0.6-1.9 \ p\overline{p} \rightarrow \omega \pi^{0}, \omega \eta \pi^{0}, \pi^{+} \pi^{-}$ $0.97-3 \ \overline{p}p \rightarrow \ \overline{N}N$ $0.7-2.4 \ \overline{p}p \rightarrow \ \overline{p}p$
 S-CHANNEL A WALUE (MeV) ● ● We do not 2260±20 ~ 2190 2155±15 2193± 2 	Use the fo	DOCUMENT ID ollowing data for a ⁶ ANISOVICH ⁷ CUTTS ^{7,8} COUPLAND ^{7,9} ALSPECTOR	verage 02 78B 77 73	<u>TECN</u> es, fits, li SPEC CNTR CNTR CNTR	<u>CHG</u> imits, o	$\begin{array}{c} \underline{COMMENT} \\ \text{etc.} \bullet \bullet \bullet \\ 0.6-1.9 \ p\overline{p} \to \ \omega \pi^{0}, \\ \omega \eta \pi^{0}, \ \pi^{+} \pi^{-} \\ 0.97-3 \ \overline{p}p \to \ \overline{N}N \\ 0.7-2.4 \ \overline{p}p \to \ \overline{p}p \\ \overline{p}p \ S \ \text{channel} \end{array}$
S-CHANNEL A <u>VALUE (MeV)</u> • • • We do not 2260±20 ~ 2190 2155±15 2193± 2 2190±10	Use the fo	DOCUMENT ID ollowing data for a ⁶ ANISOVICH ⁷ CUTTS ^{7,8} COUPLAND ^{7,9} ALSPECTOR ¹⁰ ABRAMS	verage 02 78B 77 73 70	<u>TECN</u> es, fits, li SPEC CNTR CNTR CNTR CNTR	<u>CHG</u> imits, o	$\begin{array}{c} \underline{COMMENT} \\ \text{etc.} \bullet \bullet \bullet \\ 0.6-1.9 \ p\overline{p} \to \ \omega \pi^{0}, \\ \omega \eta \pi^{0}, \ \pi^{+} \pi^{-} \\ 0.97-3 \ \overline{p}p \to \ \overline{N}N \\ 0.7-2.4 \ \overline{p}p \to \ \overline{p}p \\ \overline{p}p \ S \ \text{channel} \\ S \ \text{channel} \ \overline{p}N \end{array}$
S-CHANNEL $\overline{\mathbf{A}}$ VALUE (MeV) •••We do not 2260 ± 20 ~ 2190 2155 ± 15 2193 ± 2 2190 ± 10 ⁶ From the com and ANISOVIO ⁷ Isospins 0 and ⁸ From a fit to 19 ⁹ Referred to as 10 Seen as bump of ABRAMS 7	bined and The formation of the formati	DOCUMENT ID ollowing data for a 6 ANISOVICH 7 CUTTS 7,8 COUPLAND 7,9 ALSPECTOR 10 ABRAMS alysis of ANISOVI barated. elastic cross sectio region by ALSPEC state. See also C row structure.	verage 02 78B 77 73 70 CH 00 n. TOR OOPE	TECN es, fits, li SPEC CNTR CNTR CNTR CNTR 0J, ANIS 73. ER 68. F	<u>CHG</u> imits, o 0 SOVIC	EE 75 confirm $\overline{p}p$ results
S-CHANNEL $\overline{\mathbf{A}}$ $\underline{VALUE (MeV)}$ •••We do not 2260 ± 20 ~ 2190 2155 ± 15 2193 ± 2 2190 ± 10 ⁶ From the com and ANISOVIO ⁷ Isospins 0 and ⁸ From a fit to 19 ⁹ Referred to as ¹⁰ Seen as bump of ABRAMS 7	use the for use the for the for the the for the total end the total end T or T r in $I = 1$ 20, no nar	DOCUMENT ID Illowing data for a ⁶ ANISOVICH ⁷ CUTTS ^{7,8} COUPLAND ^{7,9} ALSPECTOR ¹⁰ ABRAMS alysis of ANISOVI parated. elastic cross section region by ALSPEC state. See also Corow structure.	verage 02 78B 77 73 70 CH 0 CH 0 n. TOR OOPE	TECN es, fits, li SPEC CNTR CNTR CNTR OJ, ANIS 73. ER 68. F	<u>CHG</u> imits, o 0 SOVIC	EE 75 confirm $\overline{p}p$ results
S-CHANNEL A VALUE (MeV) •••We do not 2260±20 ~2190 2155±15 2193±2 2190±10 ⁶ From the com 7 Isospins 0 and ⁸ From a fit to 1 ⁹ Referred to as ¹⁰ Seen as bump of ABRAMS 7 Other processes VALUE (MeV)	use the fo use the fo the dana CH 02. 1 not sep the total e T or T r in $I = 1$ 20, no nar	DOCUMENT ID offlowing data for a ⁶ ANISOVICH 7 CUTTS 7,8 COUPLAND 7,9 ALSPECTOR 10 ABRAMS alysis of ANISOVI barated. elastic cross sectio region by ALSPEC state. See also C row structure.	verage 02 78B 77 73 70 CH 0 n. TOR OOPE	TECN es, fits, li SPEC CNTR CNTR CNTR CNTR 0J, ANIS 73. ER 68. F	<u>CHG</u> imits, o 0 50VIC PEASL	$\underline{COMMENT}$ etc. • • • $0.6-1.9 \ p\overline{p} \rightarrow \omega \pi^{0}, \\ \omega \eta \pi^{0}, \pi^{+} \pi^{-}$ $0.97-3 \ \overline{p}p \rightarrow \overline{N}N$ $0.7-2.4 \ \overline{p}p \rightarrow \overline{p}p$ $\overline{p}p \ S \ channel \\ S \ channel \\ \overline{p}N$ H 01D, ANISOVICH 01E, EE 75 confirm $\overline{p}p \ results$ $\underline{COMMENT}$

$2290 \pm 20 \pm 30$	AMELIN	00 VES	$37 \pi^- p \rightarrow \eta \pi^+ \pi^- n$

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ho_3 (2250) WIDTH

$\overline{p}p \rightarrow \pi$	π or i	ĸĸ							
VALUE (MeV)		EVTS	DOCUMEN	NT ID	TEC	N	CHG	COMMENT	
ullet $ullet$ $ullet$ We do not use the following data for averages, fits, limits, etc. $ullet$ $ullet$									
$185 + 31 \\ -26 = 31$	$^{+ 17}_{-103}$	1.8k	¹¹ ABLIKIM	1 20	F BES	53		$\psi(2S) ightarrow k$	$\kappa^+ \kappa^- \eta$
~ 220			HASAN	94	RV	JE		$\overline{p} p \rightarrow \pi \pi$	
\sim 60			¹² OAKDEN	N 94	RV	JE		0.36–1.55 <u>p</u>	$p \rightarrow \pi \pi$
~ 250			¹³ MARTIN	I 80	b RV	JE			
~ 200			¹³ MARTIN	I 80	c RV	JE			
~ 150			¹⁴ CARTER	R 78	B CN	TR	0	0.7–2.4 <u>p</u> p	$\rightarrow K^-K^+$
~ 200			¹⁵ CARTER	R 77	CN	TR	0	0.7–2.4 <u>p</u> p	$\rightarrow \pi\pi$
11 Seen in 0.4 $^{+0.1}_{-1.5}$	$\psi(23)$ $\frac{5}{3}) imes 1$	5) decay .0 ^{—6} .	with branchi	ng ratio	ψ(2 <i>S</i>)	\rightarrow	Xη	$\rightarrow K^+K^-$	η = (1.9 \pm
$^{12}{ m See}$ hov	vever	KLOET	96 who fit π^-	$^+\pi^-$ only	/ and f	ind	waves	only up to .	J = 3 to be
importa	nt but	t not sigi	nificantly resor	nant.				0 0	
$^{13}I(J^P) =$	= 1(3	[–]) from	simultaneous a	analysis o	f <i>p</i> p →	harborn	π^+	and $\pi^0 \pi^0$.	
$\frac{14}{15}I = 0, 1$	1. J ^P	$= 3^{-}$ fr	om Barrelet-z	ero analys	sis.				
$^{15}I(J^{P}) =$	= 1(3	[–]) from	amplitude ana	lysis.					
SCHANN	JEI 7	$\overline{\mathbf{v}}$ \mathbf{v}							
VALUE (MeV)		• / •	DOCUMEN	IT ID	TEC	V	CHG	COMMENT	
• • • We d	lo not	use the	following data	for avera	ges, fit	s, lir	nits, e	etc. • • •	
160 ± 25			¹⁶ ANISOVI	CH 02	SPE	C		$0.6-1.9 p\overline{p}$	$_{+\pi^{-}}^{+\omega^{-}\pi^{0}}$
135 ± 75		1	^{7,18} COUPLA	ND 77	CNT	٢R	0	$0.7-2.4 \overline{p}p$	$\rightarrow \overline{a} \overline{a}$
98 ± 8			¹⁸ ALSPEC	TOR 73	CNT	٢R	-	$\overline{p}p S$ channe	el el
~ 85			¹⁹ ABRAMS	5 70	CNT	٢R		S channel \overline{p}	N
16 From th	he cor	nbined a	nalysis of AN	ISOVICH	00 I A	NIS	ovici	H 01D ANIS	OVICH 01F
_and AN	ISOVI	ICH 02.			••••,				o o o ,
$\frac{17}{10}$ From a	fit to	the tota	elastic cross	section.					
¹⁰ Isospins	0 and	d 1 not s	eparated.						
¹⁹ Seen as		$rac{1}{2}$ in $I = rac{1}{2}$	1 state. See a	also COO	PER 68	3. P	EASL	EE 75 confirm	n p p results
	AIVIS	70, 10 16	arrow structure	e.					
Other pro	cesse	S							
VALUE (MeV)			DC	CUMENT	D	T	ECN	COMMENT	
• • • We d	lo not	use the	following data	for avera	ges, fit	s, lir	nits, e	etc. • • •	
$230\pm50\pm8$	30		AN	MELIN	00	V	ΈS	$37 \ \pi^- p \rightarrow$	$\eta \pi^+ \pi^- n$
$ ho_3(2250)$ REFERENCES									
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ANISOVICH	02	PL B542	8	A.V. Anisov	vich et a	1.			
ANISOVICH	01D 01E	PL B508 PL B513	281	A.V. Anisov	vich et a	и. 1.			
AMELIN	00	NP A668	83	D. Amelin	et al.			(VE	S Collab.)
ANISOVICH	00J 96	PL B491 PR D53	47 6120	A.V. Anisov	nch <i>eta</i> ⊦FM∿	l. hrer		(RAL, LOQN (RUT)	, PNPI+) 5 NORD)
HASAN	94	PL B334	215	A. Hasan,	D.V. Bu	gg			(LOQM)
	94	NP A574	731	M.N. Oakd	en, M.R.	Pen	nington	(1.01)	
	OUR	INF B1/(0 000	ы.к. martir	ι, <i>Ο</i> . ΙVIC	ngan		(LOU	

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Citation: S. Navas et al.	(Particle Data	Group), Phys.	Rev.	D 110,	030001	(2024)
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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 <i>et al.</i>	(STON, WISC)
CARTER	77	PL 67B 117	A.A. Carter <i>et al.</i>	(LOQM, RHEL) JP
COUPLAND	77	PL 71B 460	M. Coupland <i>et al.</i>	(LOQM, RHEL)
PEASLEE	75	PL 57B 189	D.C. Peaslee et al.	(CANB, BARI, BROW+)
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