

Further States

OMITTED FROM SUMMARY TABLE

This section contains states observed by a single group, and that thus need confirmation. Publications that exclude earlier claims in this section are listed under 'Other Related Papers.'

QUANTUM NUMBERS, MASSES, WIDTHS, AND BRANCHING RATIOS

$\kappa(800)$	$I(J^P) = ?(0^+)$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
797±19±43	410 ± 43 ± 87	15090	¹ AITALA	02 E791	$D^+ \rightarrow K^- \pi^+ \pi^+$	

$X(1110)$	$I^G(J^{PC}) = 0^+(\text{even}^{++})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1107±4	111 ± 8 ± 15		DAFTARI	87 DBC	0. $\bar{p}n \rightarrow \rho^- \pi^+ \pi^-$	

$X(1420)$	$I^G(J^{PC}) = 2^+(0^{++})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1420±20	160 ± 10		FILIPPI	00 OBLX	0 $\bar{p}p \rightarrow \pi^+ \pi^+ \pi^-$	

$X(1650)$	$I^G(J^{PC}) = 0^-(?^-)$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1652±7	<50	100	PROKOSHKIN	96 GAM2	32,38 $\pi p \rightarrow \omega \eta n$	

$X(1750)$	$I^G(J^{PC}) = ??(1^{--})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1753.5±1.5±2.3	122.2 ± 6.2 ± 8.0		LINK	02k FOCS	20-160 $\gamma p \rightarrow K^+ K^- p$	

$$B(X(1750) \rightarrow \bar{K}^*(892)^0 K^0 \rightarrow K^\pm \pi^\mp K_S^0) / B(X(1750) \rightarrow K^+ K^-)$$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
<0.065	90	LINK	02k FOCS

$B(X(1750) \rightarrow \bar{K}^*(892)^\pm K^\mp \rightarrow K^\pm \pi^\mp K_S^0)/B(X(1750) \rightarrow K^+ K^-)$

<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
<0.183	90	LINK	02K FOCS

$X(1775)$ $I^G(J^{PC}) = 1^-(?^-+)$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1763±20	192 ± 60	CONDO	91 SHF	$\gamma p \rightarrow (p\pi^+)(\pi^+\pi^-\pi^-)$
1787±18	118 ± 60	CONDO	91 SHF	$\gamma p \rightarrow n\pi^+\pi^+\pi^-$

$X(1855)$ $I^G(J^{PC}) = ?^?(?^{??})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1856.6±5	20 ± 5	BRIDGES	86D SPEC	0. $\bar{p}d \rightarrow \pi\pi N$

$X(1870)$ $I^G(J^{PC}) = ?^?(?^{??})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
~ 1870	~ 10	DALKAROV	97 RVUE	0.0 $\bar{p}d \rightarrow p3\pi^-2\pi^+$

$X(1870)$ $I^G(J^{PC}) = ?^?(2^{??})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1870±40	250 ± 30	ALDE	86D GAM4	100 $\pi^- p \rightarrow 2\eta X$

$a_3(1875)$ $I^G(J^{PC}) = 0^+(1^{--})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1874±43±96	385 ± 121 ± 114	CHUNG	02 MPS	18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$

$B(a_3(1875) \rightarrow f_2(1270)\pi)/B(a_3(1875) \rightarrow \rho\pi)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.8±0.2	² CHUNG	02 MPS	18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$

$B(a_3(1875) \rightarrow \rho_3(1690)\pi)/B(a_3(1875) \rightarrow \rho\pi)$

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.9±0.3	² CHUNG	02 MPS	18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$

$\pi_2(1880)$ $I^G(J^{PC}) = 1^-(2^-+)$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>COMMENT</u>
1880±20	255 ± 45	ANISOVICH	01B $\bar{p}p \rightarrow (a_2(1320)\eta)\pi^0$

$\rho(1910)$		$I^G(J^{PC}) = 1^+(1^{--})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1911 ± 4 ± 1	29 ± 11 ± 4	FRABETTI	01 E687	$\gamma p \rightarrow 3\pi^+ 3\pi^- p$		

$a_1(1930)$		$I^G(J^{PC}) = 0^-(1^{++})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1930 ⁺³⁰ ₋₇₀	155 ± 45	ANISOVICH	01F SPEC	2.0 $\bar{p}p \rightarrow 3\pi^0$, $\pi^0\eta, \pi^0\eta'$		

$X(1935)$		$I^G(J^{PC}) = 1^+(1^{-?})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1935 ± 20	215 ± 30	EVANGELISTA	79 OMEG	10,16 $\pi^- p \rightarrow \bar{p}pn$		

$\rho_2(1940)$		$I^G(J^{PC}) = 1^+(2^{--})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1940 ± 40	155 ± 40	³ ANISOVICH	02 SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\pi^0, \omega\eta\pi^0, \pi^+\pi^-$		

$\omega_3(1945)$		$I^G(J^{PC}) = 0^-(3^{--})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1945 ± 20	115 ± 22	⁴ ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$		

$\omega(1960)$		$I^G(J^{PC}) = 0^-(1^{--})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1960 ± 25	195 ± 60	⁴ ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$		

$b_1(1960)$		$I^G(J^{PC}) = 1^+(1^{+-})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1960 ± 35	230 ± 50	³ ANISOVICH	02 SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\pi^0, \omega\eta\pi^0, \pi^+\pi^-$		

$\rho(1965)$		$I^G(J^{PC}) = 1^+(1^{--})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
1970 ± 30	260 ± 45	³ ANISOVICH	02 SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\pi^0, \omega\eta\pi^0, \pi^+\pi^-$		
2000 ± 30	295 ± 85	ANISOVICH	00J SPEC			

$h_1(1965)$ $I^G(J^{PC}) = 0^-(1^{+-})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1965 ± 45	345 ± 75	⁴ ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta,$ $\omega\pi^0\pi^0$	
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$f_1(1970)$ $I^G(J^{PC}) = 0^+(1^{++})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1971 ± 15	240 ± 45	ANISOVICH	00J SPEC		
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$X(1970)$ $I^G(J^{PC}) = ?^?(?^{??})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1970 ± 10	40 ± 20	CHLIAPNIK...	80 HBC	32 $K^+ p \rightarrow$ $2K_S^0 2\pi X$	
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$X(1975)$ $I^G(J^{PC}) = ?^?(?^{??})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
1973 ± 15	80	30	CASO	70 HBC	11.2 $\pi^- p \rightarrow$ $\rho 2\pi$
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$\omega_2(1975)$ $I^G(J^{PC}) = 0^-(2^{--})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1975 ± 20	175 ± 25	⁴ ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta,$ $\omega\pi^0\pi^0$	
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$a_2(1990)$ $I^G(J^{PC}) = 1^-(2^{++})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1990 ⁺¹⁵ ₋₃₀	190 ± 50	ANISOVICH	99C SPEC		
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$\rho(2000)$ $I^G(J^{PC}) = 1^+(1^{--})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2000 ± 30	295 ± 85	ANISOVICH	00J SPEC		
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$f_2(2000)$ $I^G(J^{PC}) = 0^+(2^{++})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2001 ± 10	312 ± 32	ANISOVICH	00J SPEC		
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$\pi_2(2005)$ $I^G(J^{PC}) = 1^-(2^{-+})$					
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2005 ± 15	200 ± 40	ANISOVICH	01F SPEC	2.0 $\bar{p}p \rightarrow 3\pi^0,$ $\pi^0\eta, \pi^0\eta'$	
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$\eta(2010)$		$I^G(J^{PC}) = 0^+(0^{-+})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>		
2010 ⁺³⁵ ₋₆₀	270 ± 60	ANISOVICH	00J	SPEC	
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$a_0(2020)$		$I^G(J^{PC}) = 1^-(0^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>		
2025 ± 30	330 ± 75	ANISOVICH	99C	SPEC	
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$X(2020)$		$I^G(J^{PC}) = ?^?(?^{??})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2015 ± 3	10 ± 4	FERRER	99	RVUE	$\pi p \rightarrow p p \bar{p} \pi (\pi)$
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$h_3(2025)$		$I^G(J^{PC}) = 0^-(3^{--})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2025 ± 20	145 ± 30	⁴ ANISOVICH	02B	SPEC	0.6–1.9 $p \bar{p} \rightarrow \omega \eta, \omega \pi^0 \pi^0$
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$b_3(2025)$		$I^G(J^{PC}) = 1^+(3^{+-})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2032 ± 12	117 ± 11	³ ANISOVICH	02	SPEC	0.6–1.9 $p \bar{p} \rightarrow \omega \pi^0, \omega \eta \pi^0, \pi^+ \pi^-$
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$\eta_2(2030)$		$I^G(J^{PC}) = 0^+(2^{-+})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>		
2030 ± 5 ± 15	205 ± 10 ± 15	ANISOVICH	00E	SPEC	
$B(a_2 \pi)_{L=0}/B(a_2 \pi)_{L=2}$					
<u>VALUE</u>		<u>DOCUMENT ID</u>	<u>TECN</u>		
0.74 ± 0.17		⁵ ANISOVICH	00E	SPEC	
$B(a_0 \pi)/B(a_2 \pi)_{L=2}$					
<u>VALUE</u>		<u>DOCUMENT ID</u>	<u>TECN</u>		
0.072 ± 0.016		⁵ ANISOVICH	00E	SPEC	
$B(f_2 \eta)/B(a_2 \pi)_{L=2}$					
<u>VALUE</u>		<u>DOCUMENT ID</u>	<u>TECN</u>		
0.074 ± 0.026		⁵ ANISOVICH	00E	SPEC	
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$f_3(2050)$		$I^G(J^{PC}) = 0^+(3^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>		
2048 ± 8	213 ± 34	ANISOVICH	00J	SPEC	

$f_0(2060)$		$I^G(J^{PC}) = 0^+(0^{++})$		
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
~ 2050	~ 120	⁶ OAKDEN	94 RVUE	0.36–1.55 $\bar{p}p \rightarrow \pi\pi$
~ 2060	~ 50	⁶ OAKDEN	94 RVUE	0.36–1.55 $\bar{p}p \rightarrow \pi\pi$

$\pi(2070)$		$I^G(J^{PC}) = 0^-(0^{-+})$		
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2070 ± 35	310 ⁺¹⁰⁰ ₋₅₀	ANISOVICH	01F SPEC	2.0 $\bar{p}p \rightarrow 3\pi^0, \pi^0\eta, \pi^0\eta'$

$a_3(2070)$		$I^G(J^{PC}) = 1^-(3^{++})$		
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
2070 ± 20	170 ± 40	ANISOVICH	99C SPEC	

$a_2(2080)$		$I^G(J^{PC}) = 1^-(2^{++})$		
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
2060 ± 20	195 ± 30	ANISOVICH	99C SPEC	
2100 ⁺¹⁰ ₋₃₀	360 ⁺⁴⁰ ₋₁₀₀	ANISOVICH	99E SPEC	

$X(2080)$		$I^G(J^{PC}) = ??(???)$		
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2080 ± 10	110 ± 20	KREYMER	80 STRC	13 $\pi^- d \rightarrow p\bar{p}n(n_s)$

$X(2080)$		$I^G(J^{PC}) = ??(3^{-?})$		
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2080 ± 10	190 ± 15	ROZANSKA	80 SPRK	18 $\pi^- p \rightarrow p\bar{p}n$

$\eta(2100)$		$I^G(J^{PC}) = 0^+(0^{-+})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2103 ± 50	187 ± 75	586	⁷ BISELLO	89B DM2	$J/\psi \rightarrow 4\pi\gamma$

$X(2100)$		$I^G(J^{PC}) = ??(0^{??})$		
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2100 ± 40	250 ± 40	ALDE	86D GAM4	100 $\pi^- p \rightarrow 2\eta X$

X(2110) $I^G(J^{PC}) = 1^+(3^{-?})$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2110 ± 10	330 ± 20	EVANGELISTA 79	OMEG	10,16 $\pi^- p \rightarrow \bar{p} p n$

f₂(2140) $I^G(J^{PC}) = 0^+(2^{++})$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>EVTS</u>		
2141 ± 12	49 ± 28	389	GREEN 86	MPSF 400 $p A \rightarrow 4 K X$

ω(2145) $I^G(J^{PC}) = 0^-(1^{--})$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2150 ± 20	235 ± 30	ANISOVICH	01C SPEC	0.6–1.9 $\bar{p} p \rightarrow \omega \eta$
2145 ± 20	200 ± 25	ANISOVICH	00D SPEC	

X(2150) $I^G(J^{PC}) = ??(2^{+?})$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2150 ± 10	260 ± 10	ROZANSKA	80 SPRK	18 $\pi^- p \rightarrow p \bar{p} n$

a₂(2175) $I^G(J^{PC}) = 0^-(2^{++})$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2175 ± 40	310 ⁺⁹⁰ ₋₄₅	ANISOVICH	01F SPEC	2.0 $\bar{p} p \rightarrow 3\pi^0, \pi^0 \eta, \pi^0 \eta'$

η(2190) $I^G(J^{PC}) = 0^+(0^{-+})$		<u>DOCUMENT ID</u>	<u>TECN</u>	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2190 ± 50	850 ± 100	BUGG	99 BES	

ω₂(2195) $I^G(J^{PC}) = 0^-(2^{--})$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2195 ± 30	225 ± 40	⁴ ANISOVICH	02B SPEC	0.6–1.9 $p \bar{p} \rightarrow \omega \eta, \omega \pi^0 \pi^0$

ω(2205) $I^G(J^{PC}) = 0^-(1^{--})$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2205 ± 30	350 ± 90	⁴ ANISOVICH	02B SPEC	0.6–1.9 $p \bar{p} \rightarrow \omega \eta, \omega \pi^0 \pi^0$

X(2210) $I^G(J^{PC}) = ??(???)$		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>			
2210 ⁺⁷⁹ ₋₂₁	203 ⁺⁴³⁷ ₋₈₇	EVANGELISTA 79B	OMEG	10 $\pi^- p \rightarrow K^+ K^- n$

X(2210) $I^G(J^{PC}) = ??(???)$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2207 ± 22	130	CASO	70 HBC	11.2 $\pi^- p$

h₁(2215) $I^G(J^{PC}) = 0^-(1^{+-})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2215 ± 40	325 ± 55	⁴ ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$

b₁(2240) $I^G(J^{PC}) = 1^+(1^{+-})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2240 ± 35	320 ± 85	³ ANISOVICH	02 SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\pi^0, \omega\eta\pi^0, \pi^+\pi^-$

ρ₂(2240) $I^G(J^{PC}) = 1^+(2^{--})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2225 ± 35	335 ⁺¹⁰⁰ ₋₅₀	³ ANISOVICH	02 SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\pi^0, \omega\eta\pi^0, \pi^+\pi^-$

ρ₄(2240) $I^G(J^{PC}) = 1^+(4^{--})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2230 ± 25	210 ± 30	³ ANISOVICH	02 SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\pi^0, \omega\eta\pi^0, \pi^+\pi^-$

π₂(2245) $I^G(J^{PC}) = 0^-(2^{-+})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2245 ± 60	320 ⁺¹⁰⁰ ₋₄₀	ANISOVICH	01F SPEC	2.0 $\bar{p}p \rightarrow 3\pi^0, \pi^0\eta, \pi^0\eta'$

η₂(2250) $I^G(J^{PC}) = 0^+(2^{-+})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2248 ± 20	280 ± 20	ANISOVICH	00I SPEC
2267 ± 14	290 ± 50	ANISOVICH	00J SPEC

π₄(2250) $I^G(J^{PC}) = 1^-(4^{-+})$

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
2250 ± 15	215 ± 25	ANISOVICH	01F SPEC	2.0 $\bar{p}p \rightarrow 3\pi^0, \pi^0\eta, \pi^0\eta'$

$\omega_4(2250)$		$I^G(J^{PC}) = 0^-(4^{--})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2250 ± 30	150 ± 50	4 ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$	

$\omega_3(2255)$		$I^G(J^{PC}) = 0^-(3^{--})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2255 ± 15	175 ± 30	4 ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$	

X(2260)		$I^G(J^{PC}) = 0^+(4^{+?})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2260 ± 20	400 ± 100	EVANGELISTA 79	OMEG	10,16 $\pi^- p \rightarrow \bar{p}pn$	

$\rho(2265)$		$I^G(J^{PC}) = 1^+(1^{--})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2265 ± 40	325 ± 80	3 ANISOVICH	02 SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\pi^0, \omega\eta\pi^0, \pi^+\pi^-$	

$a_1(2270)$		$I^G(J^{PC}) = 1^-(1^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2270 ⁺⁵⁵ ₋₄₀	305 ⁺⁷⁰ ₋₄₀	ANISOVICH	01F SPEC	2.0 $\bar{p}p \rightarrow 3\pi^0, \pi^0\eta, \pi^0\eta'$	

$a_2(2270)$		$I^G(J^{PC}) = 1^-(2^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2265 ± 20	235 ⁺⁶⁰ ₋₃₅	ANISOVICH	99C SPEC		
2280 ± 30	280 ± 50	ANISOVICH	99E SPEC		

$h_3(2275)$		$I^G(J^{PC}) = 0^-(3^{+-})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2275 ± 25	190 ± 45	4 ANISOVICH	02B SPEC	0.6–1.9 $p\bar{p} \rightarrow \omega\eta, \omega\pi^0\pi^0$	

$a_4(2280)$		$I^G(J^{PC}) = 1^-(4^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
2300 ± 20	230 ± 40	ANISOVICH	99C SPEC		
2260 ± 15	180 ± 20	ANISOVICH	99E SPEC		

$\eta(2280)$		$I^G(J^{PC}) = 0^+(0^{-+})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2285 ± 20	325 ± 30	ANISOVICH	00J SPEC
2320 ± 15	230 ± 35	⁸ ANISOVICH	00M SPEC

$\rho(2280)$		$I^G(J^{PC}) = 1^+(1^{--})$		<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
2280 ± 50	440 ± 110	ATKINSON	85 OMEG	20-70 $\gamma p \rightarrow$ $p\omega\pi^+\pi^-\pi^0$

$\omega_3(2285)$		$I^G(J^{PC}) = 0^-(3^{--})$		<u>COMMENT</u>
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	
2285 ± 60	230 ± 40	⁴ ANISOVICH	02B SPEC	0.6-1.9 $p\bar{p} \rightarrow$ $\omega\pi^0\pi^0$

$f_2(2300)$		$I^G(J^{PC}) = 0^+(2^{++})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2293 ± 13	216 ± 37	ANISOVICH	00J SPEC

$f_3(2300)$		$I^G(J^{PC}) = 0^+(3^{++})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2303 ± 15	214 ± 29	ANISOVICH	00J SPEC

$\rho_3(2300)$		$I^G(J^{PC}) = 1^+(3^{--})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2300 ⁺⁵⁰ ₋₈₀	340 ± 50	ANISOVICH	00J SPEC

$a_3(2310)$		$I^G(J^{PC}) = 1^-(3^{++})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2310 ± 40	180 ⁺¹²⁰ ₋₆₀	ANISOVICH	99C SPEC

$f_1(2310)$		$I^G(J^{PC}) = 0^+(1^{++})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2310 ± 60	255 ± 70	ANISOVICH	00J SPEC

$\eta_4(2320)$		$I^G(J^{PC}) = 0^+(4^{-+})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2328 ± 38	240 ± 90	ANISOVICH	00J SPEC

$\omega(2330)$		$I^G(J^{PC}) = 0^-(1^{--})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2330±30	435 ± 75	ATKINSON	88	OMEG	25-50 $\gamma p \rightarrow \rho^\pm \rho^0 \pi^\mp$	

$a_1(2340)$		$I^G(J^{PC}) = 1^-(1^{++})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2340±40	230 ± 70	ANISOVICH	99E	SPEC		

$X(2340)$		$I^G(J^{PC}) = ??(???)$							
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>				
2340±20	180 ± 60	126	⁹ BALTAY	75	HBC	15 $\pi^+ p \rightarrow p 5\pi$			

$\pi(2360)$		$I^G(J^{PC}) = 0^-(0^{-+})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2360±25	300^{+100}_{-50}	ANISOVICH	01F	SPEC	2.0 $\bar{p} p \rightarrow 3\pi^0, \pi^0 \eta, \pi^0 \eta'$	

$X(2360)$		$I^G(J^{PC}) = ??(4^{+?})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2360±10	430 ± 30	ROZANSKA	80	SPRK	18 $\pi^- p \rightarrow p \bar{p} n$	

$X(2440)$		$I^G(J^{PC}) = ??(5^{-?})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2440±10	310 ± 20	ROZANSKA	80	SPRK	18 $\pi^- p \rightarrow p \bar{p} n$	

$X(2680)$		$I^G(J^{PC}) = ??(???)$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2676±27	150	CASO	70	HBC	11.2 $\pi^- p \rightarrow \rho^- \pi^+ \pi^- p$	

$X(2710)$		$I^G(J^{PC}) = ??(6^{+?})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2710±20	170 ± 40	ROZANSKA	80	SPRK	18 $\pi^- p \rightarrow p \bar{p} n$	

$X(2750)$		$I^G(J^{PC}) = ??(7^{-?})$				
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>		
2747±32	195 ± 75	DENNEY	83	LASS	10 $\pi^+ p \rightarrow K^+ K^- \pi^+ p$	

X(3250)		$I^G(J^{PC}) = ??(???)$ 3-Body Decays			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
3250 ± 8 ± 20	45 ± 18	ALEEV	93 BIS2	X(3250) → $\Lambda \bar{p} K^+$	
3265 ± 7 ± 20	40 ± 18	ALEEV	93 BIS2	X(3250) → $\bar{\Lambda} p K^-$	

X(3250)		$I^G(J^{PC}) = ??(???)$ 4-Body Decays			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
3245 ± 8 ± 20	25 ± 11	ALEEV	93 BIS2	X(3250) → $\Lambda \bar{p} K^+ \pi^\pm$	
3250 ± 9 ± 20	50 ± 20	ALEEV	93 BIS2	X(3250) → $\bar{\Lambda} p K^- \pi^\mp$	
3270 ± 8 ± 20	25 ± 11	ALEEV	93 BIS2	X(3250) → $K_S^0 \rho \bar{p} K^\pm$	

FOOTNOTES for Further States

- ¹ Not seen by KOPP 01 using 7070 events of $D^0 \rightarrow K^- \pi^+ \pi^0$.
- ² Using the observable fractions of 50.0% $\rho\pi$, 56.5% $f_2\pi$, and 11.8% $\rho_3\pi$.
- ³ From the combined analysis of ANISOVICH 00J, ANISOVICH 01D, ANISOVICH 01E, and ANISOVICH 02.
- ⁴ From the combined analysis of ANISOVICH 00D, ANISOVICH 01C, and ANISOVICH 02B.
- ⁵ Corrected for all decay modes.
- ⁶ See SEMENOV 99 and KLOET 96.
- ⁷ ASTON 81B sees no peak, has 850 events in Ajinenko+Barth bins. ARESTOV 80 sees no peak.
- ⁸ Combined fit along with data of ANISOVICH 00J.
- ⁹ Dominant decay into $\rho^0 \rho^0 \pi^+$. BALTAY 78 finds confirmation in $2\pi^+ \pi^- 2\pi^0$ events which contain $\rho^+ \rho^0 \pi^0$ and $2\rho^+ \pi^-$.

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ANISOVICH	02B	PL B542 19	A.V. Anisovich <i>et al.</i>	
CHUNG	02	PR D65 072001	S.U. Chung <i>et al.</i>	
LINK	02K	PL B545 50	J.M. Link <i>et al.</i>	(FNAL FOCUS Collab.)
ANISOVICH	01B	PL B500 222	A.V. Anisovich <i>et al.</i>	
ANISOVICH	01C	PL B507 23	A.V. Anisovich <i>et al.</i>	
ANISOVICH	01D	PL B508 6	A.V. Anisovich <i>et al.</i>	
ANISOVICH	01E	PL B513 281	A.V. Anisovich <i>et al.</i>	
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SEMENOV	99	SPU 42 847	S.V. Semenov	

Translated from UFN 42 937.

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KLOET	96	PR D53 6120	W.M. Kloet, F. Myhrer	(RUTG, NORD)
PROKOSHKIN	96	SPD 41 247	Y.D. Prokoshkin, V.D. Samoilenko	(SERP)
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ALEEV	93	PAN 56 1358	A.N. Aleev <i>et al.</i>	(BIS-2 Collab.)
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CONDO	91	PR D43 2787	G.T. Condo <i>et al.</i>	(SLAC Hybrid Collab.)
BISELLO	89B	PR D39 701	G. Busetto <i>et al.</i>	(DM2 Collab.)
ATKINSON	88	ZPHY C38 535	M. Atkinson <i>et al.</i>	(BONN, CERN, GLAS+)
DAFTARI	87	PRL 58 859	I.K. Daftari <i>et al.</i>	(SYRA)
ALDE	86D	NP B269 485	D.M. Alde <i>et al.</i>	(BELG, LAPP, SERP, CERN+)
BRIDGES	86D	PL B180 313	D.L. Bridges <i>et al.</i>	(SYRA, BNL, CASE+)
GREEN	86	PRL 56 1639	D.R. Green <i>et al.</i>	(FNAL, ARIZ, FSU+)
ATKINSON	85	ZPHY C29 333	M. Atkinson <i>et al.</i>	(BONN, CERN, GLAS+)
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ANTIPOV	72	PL 40 147	Y.M. Antipov <i>et al.</i>	(SERP)
TAKAHASHI	72	PR D6 1266	K. Takahashi <i>et al.</i>	(TOHOK, PENN, NDAM+)
BENVENUTI	71	PRL 27 283	A.C. Benvenuti <i>et al.</i>	(WISC)
SABAU	71	LNC 1 514	M. Sabeu, J.L. Uretsky	(BUCH, ANL)
BAUD	70	PL 31B 549	R. Baud <i>et al.</i>	(CERN Boson Spectrometer Collab.)
ANDERSON	69	PRL 22 1390	E.W. Anderson <i>et al.</i>	(BNL, CMU)
BOESEBECK	68	NP B4 501	K. Boesebeck <i>et al.</i>	(AACH, BERL, CERN)
ALLES-...	67B	NC 50A 776	V. Alles-Borelli <i>et al.</i>	(CERN, BONN)
CHIKOVANI	66	PL 22 233	G.E. Chikovani <i>et al.</i>	(SERP)
FOCACCI	66	PRL 17 890	M.N. Focacci <i>et al.</i>	(CERN)