

**$\bar{N}N(2000-2500)$** 

## OMITTED FROM SUMMARY TABLE

This node contains high-mass structures coupling to the baryon-antibaryon system.

 $\bar{N}N(2000-2500)$  QUANTUM NUMBERS, MASSES, WIDTHS, AND BRANCHING RATIOS

<b><math>f_1(1970)</math></b> $I^G(J^{PC}) = 0^+(1^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
1971 ± 15	240 ± 45	ANISOVICH	00J SPEC
<b><math>a_2(1990)</math></b> $I^G(J^{PC}) = 1^-(2^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
1990 <sup>+15</sup> <sub>-30</sub>	190 ± 50	ANISOVICH	99C SPEC
<b><math>\rho_3(1990)</math></b> $I^G(J^{PC}) = 1^+(3^{--})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
1981 ± 14	180 ± 35	ANISOVICH	00J SPEC
2007	267	HASAN	94
<b><math>\rho(2000)</math></b> $I^G(J^{PC}) = 1^+(1^{--})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2000 ± 30	295 ± 85	ANISOVICH	00J SPEC
1988	244	HASAN	94
<b><math>f_2(2000)</math></b> $I^G(J^{PC}) = 0^+(2^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2001 ± 10	312 ± 32	ANISOVICH	00J SPEC
<b><math>\eta(2010)</math></b> $I^G(J^{PC}) = 0^+(0^{-+})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2010 <sup>+35</sup> <sub>-60</sub>	270 ± 60	ANISOVICH	00J SPEC
<b><math>a_0(2020)</math></b> $I^G(J^{PC}) = 1^-(0^{++})$			
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2025 ± 30	330 ± 75	ANISOVICH	99C SPEC
<b><math>\eta_2(2030)</math></b> $I^G(J^{PC}) = 0^+(2^{-+})$			
<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	<sup>1</sup> 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	<sup>1</sup> 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	<sup>1</sup> ANISOVICH	00E SPEC

**$f_3(2050)$   $I^G(J^{PC}) = 0^+(3^{++})$**

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2048 ± 8	213 ± 34	ANISOVICH	00J SPEC

**$a_3(2070)$   $I^G(J^{PC}) = 1^-(3^{++})$**

<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 <sup>+10</sup> <sub>-30</sub>	360 <sup>+40</sup> <sub>-100</sub>	ANISOVICH	99E SPEC

**$f_0(2100)$   $I^G(J^{PC}) = 0^+(0^{++})$**

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2105 ± 16	200 ± 25	ANISOVICH	00B SPEC
2102 ± 13	211 ± 29	ANISOVICH	00J SPEC
2090 ± 30	330 ± 100	BAI	00A BES
2105 ± 10	200 ± 25	ANISOVICH	99K SPEC
2104	203	BUGG	95

**$\Gamma(\pi^0\pi^0)/\Gamma(\eta\eta)$**

<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
0.71 ± 0.17	ANISOVICH	00B SPEC

**$a_1(2100)$   $I^G(J^{PC}) = 1^-(1^{++})$**

<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2100 ± 20	300 <sup>+30</sup> <sub>-60</sub>	ANISOVICH	99E SPEC

<b><math>\omega(2145)</math></b>		$I^G(J^{PC}) = 0^-(1^{--})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2145 ± 20	200 ± 25	ANISOVICH	00D SPEC

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

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<b><math>f_2(2240)</math></b>		$I^G(J^{PC}) = 0^+(2^{++})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2240 ± 15	241 ± 30	ANISOVICH	00J SPEC
2226	226	HASAN	94

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<b><math>\eta_2(2250)</math></b>		$I^G(J^{PC}) = 0^+(2^{-+})$	
<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

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<b><math>h_1(2265)</math></b>		$I^G(J^{PC}) = 0^-(1^{+-})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2265 ± 25	190 ± 35	ANISOVICH	00D SPEC

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

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<b><math>h_3(2275)</math></b>		$I^G(J^{PC}) = 0^-(3^{+-})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2275 ± 35	180 ± 35	ANISOVICH	00D SPEC

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

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<b><math>\eta(2280)</math></b>		$I^G(J^{PC}) = 0^+(0^{-+})$	
<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	<sup>2</sup> ANISOVICH	00M SPEC

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

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

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

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

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

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<b><math>f_0(2330)</math></b>		$I^G(J^{PC}) = 0^+(0^{++})$	
<u>MASS (MeV)</u>	<u>WIDTH (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>
2337 ± 14	217 ± 33	ANISOVICH	00J SPEC
2321	223	HASAN	94

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

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### $\bar{N}(2000-2500)$ FOOTNOTES

<sup>1</sup> Corrected for all decay modes.

<sup>2</sup> Combined fit along with data of ANISOVICH 00J.

## $\bar{N}N(2000-2500)$ REFERENCES

ANISOVICH	00B	NP A662 319	A.V. Anisovich <i>et al.</i>	
ANISOVICH	00D	PL B476 15		
ANISOVICH	00E	PL B477 19	A.V. Anisovich <i>et al.</i>	
ANISOVICH	00I	PL B491 40	A.V. Anisovich <i>et al.</i>	
ANISOVICH	00J	PL B491 47	A.V. Anisovich <i>et al.</i>	
ANISOVICH	00M	PL B496 145	A.V. Anisovich <i>et al.</i>	
BAI	00A	PL B472 207	J.Z. Bai <i>et al.</i>	(BES Collab.)
ANISOVICH	99C	PL B452 173	A.V. Anisovich <i>et al.</i>	
ANISOVICH	99E	PL B452 187	A.V. Anisovich <i>et al.</i>	
ANISOVICH	99K	PL B468 309	A.V. Anisovich <i>et al.</i>	
BUGG	99	PL B458 511	D.V. Bugg <i>et al.</i>	
BUGG	95	PL B353 378	D.V. Bugg <i>et al.</i>	(LOQM, PNPI, WASH)
HASAN	94	PL B334 215	A. Hasan, D.V. Bugg	(LOQM)

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