NODE=M161

$a_1(1640)$

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

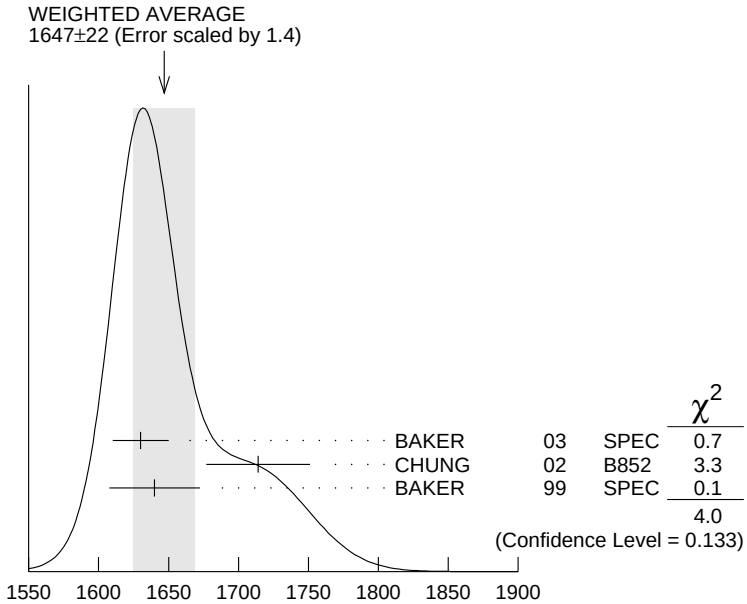
OMITTED FROM SUMMARY TABLE

Seen in the amplitude analysis of the $3\pi^0$ system produced in $\overline{p}p \rightarrow 4\pi^0$. Possibly seen in the study of the hadronic structure in decay $\tau \rightarrow 3\pi\nu_\tau$ (ABREU 98G and ASNER 00). Needs confirmation. NODE=M161

$a_1(1640)$ MASS

NODE=M161M

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
1647±22 OUR AVERAGE		Error includes scale factor of 1.4. See the ideogram below.			
1630±20	35280	[1] BAKER	03	SPEC	$\overline{p}p \rightarrow \omega\pi^+\pi^-\pi^0$
1714± 9±36		CHUNG	02	B852	18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$
1640±12±30		BAKER	99	SPEC	1.94 $\overline{p}p \rightarrow 4\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1670±90		BELLINI	85	SPEC	40 $\pi^- A \rightarrow \pi^-\pi^+\pi^- A$



[1] Using the $a_1(1260)$ mass and width results of BOWLER 88. NODE=M161M;LINKAGE=KB

$a_1(1640)$ WIDTH

NODE=M161W

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
254± 27 OUR AVERAGE		Error includes scale factor of 1.1.			
225± 30	35280	[2] BAKER	03	SPEC	$\overline{p}p \rightarrow \omega\pi^+\pi^-\pi^0$
308± 37±62		CHUNG	02	B852	18.3 $\pi^- p \rightarrow \pi^+\pi^-\pi^- p$
300± 22±40		BAKER	99	SPEC	1.94 $\overline{p}p \rightarrow 4\pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
300±100		BELLINI	85	SPEC	40 $\pi^- A \rightarrow \pi^-\pi^+\pi^- A$

[2] Using the $a_1(1260)$ mass and width results of BOWLER 88. NODE=M161W;LINKAGE=KB

$a_1(1640)$ DECAY MODES

NODE=M161215;NODE=M161

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$\pi\pi\pi$	seen	DESIG=3;OUR EST;→ UNCHECKED ←
Γ_2	$f_2(1270)\pi$	seen	DESIG=1;OUR EST;→ UNCHECKED ←
Γ_3	$\sigma\pi$	seen	DESIG=2;OUR EST;→ UNCHECKED ←
Γ_4	$\rho\pi_{S-wave}$	seen	DESIG=7;OUR EST;→ UNCHECKED ←
Γ_5	$\rho\pi_{D-wave}$	seen	DESIG=4;OUR EST;→ UNCHECKED ←
Γ_6	$\omega\pi\pi$	seen	DESIG=5;OUR EST;→ UNCHECKED ←
Γ_7	$f_1(1285)\pi$	seen	DESIG=6;OUR EST;→ UNCHECKED ←
Γ_8	$a_1(1260)\eta$	not seen	DESIG=8

$a_1(1640)$ BRANCHING RATIOS

NODE=M161220

$\Gamma(f_2(1270)\pi)/\Gamma(\sigma\pi)$ — Γ_2/Γ_3

NODE=M161R1
NODE=M161R1

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.24 ± 0.07	BAKER	99	SPEC	$1.94\ \overline{p}p \rightarrow 4\pi^0$

$\Gamma(\rho\pi_{D-wave})/\Gamma_{total}$ — Γ_5/Γ

NODE=M161R2
NODE=M161R2

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	CHUNG	02	B852	$18.3\ \pi^- p \rightarrow \pi^+\pi^-\pi^- p$
seen	AMELIN	95B	VES	$36\ \pi^- A \rightarrow \pi^+\pi^-\pi^- A$

$\Gamma(\omega\pi\pi)/\Gamma_{total}$ — Γ_6/Γ

NODE=M161R3
NODE=M161R3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
seen	35280	[3] BAKER	03	SPEC	$\overline{p}p \rightarrow \omega\pi^+\pi^-\pi^0$

$\Gamma(f_1(1285)\pi)/\Gamma_{total}$ — Γ_7/Γ

NODE=M161R4
NODE=M161R4

VALUE	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	KUHN	04	B852	$18\ \pi^- p \rightarrow \eta\pi^+\pi^-\pi^- p$
seen	LEE	94	MPS2	$18\ \pi^- p \rightarrow K^+\overline{K}^0\pi^-\pi^- p$

$\Gamma(a_1(1260)\eta)/\Gamma_{total}$ — Γ_8/Γ

NODE=M161R5
NODE=M161R5

VALUE	DOCUMENT ID		TECN	COMMENT
not seen	KUHN	04	B852	$18\ \pi^- p \rightarrow \eta\pi^+\pi^-\pi^- p$

[3] Assuming the $\omega\rho$ mechanism for the $\omega\pi\pi$ state.

NODE=M161R;LINKAGE=KB

$a_1(1640)$ REFERENCES

NODE=M161

KUHN	04	PL B595 109	J. Kuhn *et al.*	(BNL E852 Collab.)	REFID=49773
BAKER	03	PL B563 140	C.A. Baker *et al.*		REFID=49414
CHUNG	02	PR D65 072001	S.U. Chung *et al.*	(BNL E852 Collab.)	REFID=48837
ASNER	00	PR D61 012002	D.M. Asner *et al.*	(CLEO Collab.)	REFID=47339
BAKER	99	PL B449 114	C.A. Baker *et al.*		REFID=46888
ABREU	98G	PL B426 411	P. Abreu *et al.*	(DELPHI Collab.)	REFID=45909
AMELIN	95B	PL B356 595	D.V. Amelin *et al.*	(SERP, TBIL)	REFID=44433
LEE	94	PL B323 227	J.H. Lee *et al.*	(BNL, IND, KYUN, MASD+)	REFID=44092
BOWLER	88	PL B209 99	M.G. Bowler	(OXF)	REFID=40578
BELLINI	85	SJNP 41 781	D. Bellini *et al.*		REFID=47490
		Translated from YAF 41 1223.			