Δ BARYONS
$(S = 0, I = 3/2)$

$\Delta^{++} = uuu$, $\Delta^{+} = uud$, $\Delta^{0} = udd$, $\Delta^{-} = ddd$

NODE=BXXX010

$\Delta(1232)\ 3/2^+$

$I(J^P) = \frac{3}{2}(\frac{3}{2}^+)$

NODE=B033

Re(pole position) = 1209 to 1211 (≈ 1210) MeV — NODE=B033RE;DTYPE=i;OUR EST; → UNCHECKED ←
−2Im(pole position) = 98 to 102 (≈ 100) MeV — NODE=B033IM;DTYPE=i;OUR EST; → UNCHECKED ←
Breit-Wigner mass (mixed charges) = 1230 to 1234 (≈ 1232) MeV — NODE=B033M;DTYPE=M;OUR EST; → UNCHECKED ←
Breit-Wigner full width (mixed charges) = 114 to 120 (≈ 117) MeV — NODE=B033W;DTYPE=G;OUR EST; → UNCHECKED ←

NODE=B033245;NODE=B033

$\Delta(1232)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	99.4 %	229	DESIG=1;OUR EST
$N\gamma$	0.55–0.65 %	259	DESIG=3;OUR EST
$N\gamma$, helicity=1/2	0.11–0.13 %	259	DESIG=4;OUR EST
$N\gamma$, helicity=3/2	0.44–0.52 %	259	DESIG=5;OUR EST
pe^+e^-	$(4.2\pm0.7)\times10^{-5}$	259	DESIG=6

$\Delta(1600)\ 3/2^+$

$I(J^P) = \frac{3}{2}(\frac{3}{2}^+)$

NODE=B019

Re(pole position) = 1470 to 1590 (≈ 1520) MeV — NODE=B019RE;DTYPE=i;OUR EST; → UNCHECKED ←
−2Im(pole position) = 150 to 320 (≈ 280) MeV — NODE=B019IM;DTYPE=i;OUR EST; → UNCHECKED ←
Breit-Wigner mass = 1500 to 1640 (≈ 1570) MeV — NODE=B019M;DTYPE=M;OUR EST; → UNCHECKED ←
Breit-Wigner full width = 200 to 300 (≈ 250) MeV — NODE=B019W;DTYPE=G;OUR EST; → UNCHECKED ←

NODE=B019225;NODE=B019

$\Delta(1600)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	8–24%	492	DESIG=1
$N\pi\pi$	58–84 %	454	DESIG=11;OUR EST
$\Delta(1232)\pi$	58–82 %	276	DESIG=22;OUR EST
$\Delta(1232)\pi$, P-wave	72–82%	276	DESIG=3
$\Delta(1232)\pi$, F-wave	<2%	276	DESIG=4
$N\rho$	(7 ± 4) %	†	DESIG=26
$N\rho$, S=1/2	(2.0 ± 2.0) %	†	DESIG=27
$N\rho$, S=3/2, P-wave	(5.0 ± 3.0) %	†	DESIG=28
$N(1440)\pi$	17–27%	†	DESIG=24
$N\gamma$	0.001–0.035 %	505	DESIG=25;OUR EST
$N\gamma$, helicity=1/2	0.0–0.02 %	505	DESIG=9;OUR EST
$N\gamma$, helicity=3/2	0.001–0.015 %	505	DESIG=10;OUR EST

$\Delta(1620)\ 1/2^-$

$I(J^P) = \frac{3}{2}(\frac{1}{2}^-)$

NODE=B082

Re(pole position) = 1590 to 1610 (≈ 1600) MeV — NODE=B082RE;DTYPE=i;OUR EST; → UNCHECKED ←
−2Im(pole position) = 80 to 140 (≈ 110) MeV — NODE=B082IM;DTYPE=i;OUR EST; → UNCHECKED ←
Breit-Wigner mass = 1590 to 1630 (≈ 1610) MeV — NODE=B082M;DTYPE=M;OUR EST; → UNCHECKED ←
Breit-Wigner full width = 110 to 150 (≈ 130) MeV — NODE=B082W;DTYPE=G;OUR EST; → UNCHECKED ←

$\Delta(1620)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$N\pi$	25–35 %	520
$N\pi\pi$	>67 %	484
$\Delta(1232)\pi$	44–72 %	311
$N\rho$	23–32%	†
$N\rho$, S=1/2	23–32%	†
$N\rho$, S=3/2	<0.04%	†
$N(1440)\pi$	<9 %	98
$N\gamma$, helicity=1/2	0.03–0.10 %	532

NODE=B082225;NODE=B082
DESIG=1;OUR EST
DESIG=2;OUR EST
DESIG=3;OUR EST
DESIG=182;OUR EST
DESIG=4;OUR EST
DESIG=5;OUR EST
DESIG=6;OUR EST
DESIG=7;OUR EST

$\Delta(1700)$ 3/2$^-$

$I(J^P) = \frac{3}{2}(\frac{3}{2}^-)$

NODE=B010

Re(pole position) = 1640 to 1690 (≈ 1665) MeV
−2Im(pole position) = 200 to 300 (≈ 250) MeV
Breit-Wigner mass = 1690 to 1730 (≈ 1710) MeV
Breit-Wigner full width = 220 to 380 (≈ 300) MeV

NODE=B010RE;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B010IM;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B010M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B010W;DTYPE=G;OUR EST; → UNCHECKED ←
NODE=B010225;NODE=B010

$\Delta(1700)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$N\pi$	10–20 %	588
$N\pi\pi$	>31 %	557
$\Delta(1232)\pi$	9–70 %	394
$\Delta(1232)\pi$, S-wave	5–54 %	394
$\Delta(1232)\pi$, D-wave	4–16 %	394
$N\rho$	(15 ±4) %	†
$N\rho$, S=3/2, S-wave	22–32%	†
$N(1440)\pi$	(3.0±2.0) %	215
$N(1520)\pi$, P-wave	1–5 %	133
$N(1535)\pi$	0.5–1.5 %	113
$\Delta(1232)\eta$	3–7 %	†
$N\gamma$	0.22–0.60 %	598
$N\gamma$, helicity=1/2	0.12–0.30 %	598
$N\gamma$, helicity=3/2	0.10–0.30 %	598

DESIG=1;OUR EST
DESIG=3;OUR EST
DESIG=181;OUR EST
DESIG=4;OUR EST
DESIG=5;OUR EST
DESIG=189
DESIG=7;OUR EST
DESIG=188
DESIG=11;OUR EST
DESIG=186;OUR EST
DESIG=187;OUR EST
DESIG=185;OUR EST
DESIG=9;OUR EST
DESIG=10;OUR EST

$\Delta(1900)$ 1/2$^-$

$I(J^P) = \frac{3}{2}(\frac{1}{2}^-)$

NODE=B030

Re(pole position) = 1830 to 1900 (≈ 1865) MeV
−2Im(pole position) = 180 to 300 (≈ 240) MeV
Breit-Wigner mass = 1840 to 1920 (≈ 1860) MeV
Breit-Wigner full width = 180 to 320 (≈ 250) MeV

NODE=B030RE;DTYPE=r;OUR EST; → UNCHECKED ←
NODE=B030IM;DTYPE=r;OUR EST; → UNCHECKED ←
NODE=B030M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B030W;DTYPE=G;OUR EST; → UNCHECKED ←
NODE=B030225;NODE=B030

$\Delta(1900)$ DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)
$N\pi$	4–12%	685
ΣK	seen	367
$N\pi\pi$	> 52%	660
$\Delta(1232)\pi$	30–70%	509
$N\rho$	22–60 %	361
$N\rho$, S=1/2	11–35%	361
$N\rho$, S=3/2	11–25%	361
$N(1440)\pi$	3–32%	353
$N(1520)\pi$	2–10%	288
$\Delta(1232)\eta$	< 2%	251
$N\gamma$, helicity=1/2	0.06–0.43 %	693

DESIG=1
DESIG=2;OUR EST
DESIG=6;OUR EST
DESIG=11
DESIG=8;OUR EST
DESIG=12
DESIG=3
DESIG=14
DESIG=15
DESIG=13
DESIG=5;OUR EST

$\Delta(1905)$ 5/2$^+$

$I(J^P) = \frac{3}{2}(\frac{5}{2}^+)$

NODE=B011

Re(pole position) = 1750 to 1800 (≈ 1770) MeV
−2Im(pole position) = 260 to 340 (≈ 300) MeV
Breit-Wigner mass = 1855 to 1910 (≈ 1880) MeV
Breit-Wigner full width = 270 to 400 (≈ 330) MeV

NODE=B011RE;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B011IM;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B011M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B011W;DTYPE=G;OUR EST; → UNCHECKED ←

NODE=B011225;NODE=B011

Δ(1905) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	9–15%	698	DESIG=1
$N\pi\pi$	>65%	673	DESIG=3
$\Delta(1232)\pi$	>48%	524	DESIG=181;OUR EST
$\Delta(1232)\pi$, P-wave	8–43%	524	DESIG=4
$\Delta(1232)\pi$, F-wave	40–58%	524	DESIG=5
$N\rho$	(25±10) %	385	DESIG=186
$N\rho$, S=3/2, P-wave	17–35%	385	DESIG=7
$N(1535)\pi$	< 1 %	293	DESIG=11
$N(1680)\pi$, P-wave	5–15%	133	DESIG=13
$\Delta(1232)\eta$	2–6%	282	DESIG=12
$N\gamma$	0.012–0.036 %	706	DESIG=185;OUR EST
$N\gamma$, helicity=1/2	0.002–0.006 %	706	DESIG=9;OUR EST
$N\gamma$, helicity=3/2	0.01–0.03 %	706	DESIG=10;OUR EST

Δ(1910) 1/2$^+$

$I(J^P) = \frac{3}{2}(\frac{1}{2}^+)$

NODE=B012

Re(pole position) = 1800 to 1900 (≈ 1850) MeV
−2Im(pole position) = 200 to 500 (≈ 350) MeV
Breit-Wigner mass = 1850 to 1950 (≈ 1900) MeV
Breit-Wigner full width = 200 to 400 (≈ 300) MeV

NODE=B012RE;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B012IM;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B012M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B012W;DTYPE=G;OUR EST; → UNCHECKED ←
NODE=B012225;NODE=B012

Δ(1910) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	10–30%	710	DESIG=1
ΣK	4–14%	410	DESIG=2
$\Delta(1232)\pi$	34–66%	539	DESIG=181
$N\rho$	(10 ±4) %	409	DESIG=188
$N\rho$, S=1/2	(5.0±3.0) %	409	DESIG=184
$N\rho$, S=3/2	(5.0±3.0) %	409	DESIG=185
$N(1440)\pi$	3–45%	386	DESIG=6
$N(1535)\pi$	(4.0±2.0) %	311	DESIG=186
$\Delta(1232)\eta$	5–13%	310	DESIG=8
$N\gamma$, helicity=1/2	0.0–0.02 %	718	DESIG=7;OUR EST

Δ(1920) 3/2$^+$

$I(J^P) = \frac{3}{2}(\frac{3}{2}^+)$

NODE=B117

Re(pole position) = 1850 to 1950 (≈ 1900) MeV
−2Im(pole position) = 200 to 400 (≈ 300) MeV
Breit-Wigner mass = 1870 to 1970 (≈ 1920) MeV
Breit-Wigner full width = 240 to 360 (≈ 300) MeV

NODE=B117RE;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B117IM;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B117M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B117W;DTYPE=G;OUR EST; → UNCHECKED ←

Δ(1920) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	5–20 %	723	DESIG=1
ΣK	2–6 %	431	DESIG=2
$N\pi\pi$	>46 %	699	DESIG=7;OUR EST
$\Delta(1232)\pi$	(38±15) %	553	DESIG=14
$\Delta(1232)\pi$, P-wave	2–28 %	553	DESIG=3
$\Delta(1232)\pi$, F-wave	44–72 %	553	DESIG=11
$N\rho$	(57± 8) %	432	DESIG=15
$N\rho$, S=1/2	(8± 4) %	432	DESIG=16
$N\rho$, S=3/2 , P-wave	(14± 5) %	432	DESIG=17
$N\rho$, S=3/2 , F-wave	(35± 6) %	432	DESIG=18
$N(1440)\pi$, P-wave	4–86 %	403	DESIG=4
$N(1520)\pi$, S-wave	< 5 %	341	DESIG=13
$N(1535)\pi$	< 2 %	328	DESIG=8
$N a_0(980)$	seen	41	DESIG=9
$\Delta(1232)\eta$	5–17 %	336	DESIG=10
$N\gamma$	0.01–0.84 %	731	DESIG=12;OUR EST
$N\gamma$, helicity=1/2	0.0–0.42 %	731	DESIG=5;OUR EST
$N\gamma$, helicity=3/2	0.01–0.42 %	731	DESIG=6;OUR EST

NODE=B117225;NODE=B117

Δ(1930) 5/2$^-$

$I(J^P) = \frac{3}{2}(\frac{5}{2}^-)$

NODE=B013

Re(pole position) = 1820 to 1880 (≈ 1850) MeV
−2Im(pole position) = 300 to 450 (≈ 320) MeV
Breit-Wigner mass = 1900 to 2000 (≈ 1950) MeV
Breit-Wigner full width = 200 to 400 (≈ 300) MeV

NODE=B013RE;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B013IM;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B013M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B013W;DTYPE=G;OUR EST; → UNCHECKED ←
NODE=B013225;NODE=B013

Δ(1930) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	5–15 %	742	DESIG=1;OUR EST
$\Delta(1232)\pi$	(33 ±9) %	575	DESIG=186
$\Delta(1232)\pi$, D-wave	(28 ±7) %	575	DESIG=187
$\Delta(1232)\pi$, G-wave	(5 ±5) %	575	DESIG=188
$N\rho$	(33 ±8) %	464	DESIG=189
$N\rho$, S=1/2	(3.0±2.0) %	464	DESIG=190
$N\rho$, S=3/2 , G-wave	(30 ±8) %	464	DESIG=192
$N\gamma$	0.0–0.01 %	749	DESIG=184;OUR EST
$N\gamma$, helicity=1/2	0.0–0.005 %	749	DESIG=4;OUR EST
$N\gamma$, helicity=3/2	0.0–0.004 %	749	DESIG=5;OUR EST

Δ(1950) 7/2$^+$

$I(J^P) = \frac{3}{2}(\frac{7}{2}^+)$

NODE=B083

Re(pole position) = 1870 to 1890 (≈ 1880) MeV
−2Im(pole position) = 220 to 260 (≈ 240) MeV
Breit-Wigner mass = 1915 to 1950 (≈ 1930) MeV
Breit-Wigner full width = 235 to 335 (≈ 285) MeV

NODE=B083RE;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B083IM;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B083M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B083W;DTYPE=G;OUR EST; → UNCHECKED ←

NODE=B083225;NODE=B083

Δ(1950) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	35–45 %	729	DESIG=1
ΣK	0.3–0.5 %	441	DESIG=2;OUR EST
$N\pi\pi$	37–77 %	706	DESIG=171;OUR EST
$\Delta(1232)\pi$	(4.0±3.0) %	560	DESIG=187
$\Delta(1232)\pi$, F-wave	1–9 %	560	DESIG=3;OUR EST
$N\rho$	(10 ±5) %	443	DESIG=188
$N\rho$, S=1/2	(10 ±5) %	443	DESIG=186
$N(1680)\pi$, P-wave	3–9 %	191	DESIG=11;OUR EST
$\Delta(1232)\eta$	< 0.6 %	349	DESIG=10;OUR EST
$N\gamma$	0.06–0.14 %	737	DESIG=185;OUR EST
$N\gamma$, helicity=1/2	0.03–0.05 %	737	DESIG=8;OUR EST
$N\gamma$, helicity=3/2	0.04–0.09 %	737	DESIG=9;OUR EST

Δ(2200) 7/2$^-$

$I(J^P) = \frac{3}{2}(\frac{7}{2}^-)$

NODE=B135

Re(pole position) = 2050 to 2150 (≈ 2100) MeV
−2Im(pole position) = 260 to 420 (≈ 340) MeV
Breit-Wigner mass = 2150 to 2250 (≈ 2200) MeV
Breit-Wigner full width = 200 to 500 (≈ 350) MeV

NODE=B135RE;DTYPE=r;OUR EST; → UNCHECKED ←
NODE=B135IM;DTYPE=r;OUR EST; → UNCHECKED ←
NODE=B135M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B135W;DTYPE=G;OUR EST; → UNCHECKED ←

Δ(2200) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	2–8 %	894	NODE=B135225;DESIG=1
ΣK	1–7 %	672	DESIG=3;OUR EST
$N\pi\pi$	>45 %	876	DESIG=7;OUR EST
$\Delta\pi$	>45 %	747	DESIG=8;OUR EST
$\Delta\pi$, D-wave	(70±30) %	747	DESIG=4
$\Delta\pi$, G-wave	5–25 %	747	DESIG=5;OUR EST
$\Delta\eta$, D-wave	seen	614	DESIG=6;OUR EST

Δ(2420) 11/2$^+$

$I(J^P) = \frac{3}{2}(\frac{11}{2}^+)$

NODE=B084

Re(pole position) = 2300 to 2500 (≈ 2400) MeV
−2Im(pole position) = 350 to 550 (≈ 450) MeV
Breit-Wigner mass = 2300 to 2600 (≈ 2450) MeV
Breit-Wigner full width = 300 to 700 (≈ 500) MeV

NODE=B084RE;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B084IM;DTYPE=i;OUR EST; → UNCHECKED ←
NODE=B084M;DTYPE=M;OUR EST; → UNCHECKED ←
NODE=B084W;DTYPE=G;OUR EST; → UNCHECKED ←
NODE=B084225;NODE=B084

Δ(2420) DECAY MODES	Fraction (Γ_i/Γ)	p (MeV/c)	
$N\pi$	5–10 %	1040	DESIG=1;OUR EVAL