

# Ω BARYONS

## (S = -3, I = 0)

$\Omega^- = sss$

**Ω<sup>-</sup>**

$$I(J^P) = 0(\frac{3}{2}^+)$$

$J^P = \frac{3}{2}^+$  is the quark-model prediction; and  $J = 3/2$  is fairly well established.

Mass  $m = 1672.45 \pm 0.29$  MeV

$$(m_{\Omega^-} - m_{\bar{\Omega}^+}) / m_{\Omega^-} = (-1 \pm 8) \times 10^{-5}$$

Mean life  $\tau = (0.821 \pm 0.011) \times 10^{-10}$  s

$$c\tau = 2.461$$
 cm

$$(\tau_{\Omega^-} - \tau_{\bar{\Omega}^+}) / \tau_{\Omega^-} = 0.00 \pm 0.05$$

Magnetic moment  $\mu = -2.02 \pm 0.05 \mu_N$

### Decay parameters

$$\alpha(\Omega^-) \alpha_{-}(\Lambda) \text{ FOR } \Omega^- \rightarrow \Lambda K^- = 0.0115 \pm 0.0015$$

$$\Lambda K^- \quad \alpha = 0.0154 \pm 0.0020$$

$$\Lambda K^-, \bar{\Lambda} K^+ \quad (\alpha + \bar{\alpha}) / (\alpha - \bar{\alpha}) = -0.02 \pm 0.13$$

$$\Xi^0 \pi^- \quad \alpha = 0.09 \pm 0.14$$

$$\Xi^- \pi^0 \quad \alpha = 0.05 \pm 0.21$$

Ω <sup>-</sup> DECAY MODES	Fraction (Γ <sub>i</sub> /Γ)	Scale factor/ Confidence level	p (MeV/c)
ΛK <sup>-</sup>	(67.7 ± 0.7 ) %		211
Ξ <sup>0</sup> π <sup>-</sup>	(24.3 ± 0.7 ) %	S=1.5	294
Ξ <sup>-</sup> π <sup>0</sup>	( 8.55±0.33) %		289
Ξ <sup>-</sup> π <sup>+</sup> π <sup>-</sup>	( 3.7 <sup>+0.7</sup> / <sub>-0.6</sub> ) × 10 <sup>-4</sup>		189
Ξ(1530) <sup>0</sup> π <sup>-</sup>	< 7 × 10 <sup>-5</sup>	CL=90%	17
Ξ <sup>0</sup> e <sup>-</sup> $\bar{\nu}_e$	( 5.6 ± 2.8 ) × 10 <sup>-3</sup>		319
Ξ <sup>-</sup> γ	< 4.6 × 10 <sup>-4</sup>	CL=90%	314
<b>ΔS = 2 forbidden (S2) modes</b>			
Λπ <sup>-</sup>	S2 < 2.9 × 10 <sup>-6</sup>	CL=90%	449

**$\Omega(2012)^-$**

$$I(J^P) = 0(?^-)$$

Mass  $m = 2012.4 \pm 0.9$  MeV

Full width  $\Gamma = 6.4^{+3.0}_{-2.6}$  MeV

Branching fractions are given relative to the one **DEFINED AS 1**.

<b><math>\Omega(2012)^-</math> DECAY MODES</b>	Fraction ( $\Gamma_i/\Gamma$ )	Confidence level	$p$ (MeV/c)
$\Xi^0 K^-$	<b>DEFINED AS 1</b>		403
$\Xi^- \bar{K}^0$	$0.83 \pm 0.21$		392
$\Xi^0 \pi^0 K^-$	$< 0.30$	90%	245
$\Xi^0 \pi^- \bar{K}^0$	$< 0.21$	90%	230
$\Xi^- \pi^0 \bar{K}^0$	$< 0.7$	90%	226
$\Xi^- \pi^+ K^-$	$< 0.08$	90%	224

**$\Omega(2250)^-$**

$$I(J^P) = 0(?^?)$$

Mass  $m = 2252 \pm 9$  MeV

Full width  $\Gamma = 55 \pm 18$  MeV

<b><math>\Omega(2250)^-</math> DECAY MODES</b>	Fraction ( $\Gamma_i/\Gamma$ )	$p$ (MeV/c)
$\Xi^- \pi^+ K^-$	seen	532
$\Xi(1530)^0 K^-$	seen	437