

$h_b(1P)$

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

Quantum numbers are quark model predictions, $C = -$ established by $\eta_b \gamma$ decay.

$h_b(1P)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
9899.3 ± 0.8 OUR AVERAGE				
9899.3 ± 0.4 ± 1.0	112k	TAMPONI	15 BELL	$e^+e^- \rightarrow \gamma\eta + \text{hadrons}$
9899.1 ± 0.4 ± 1.0	70k	MIZUK	12 BELL	$e^+e^- \rightarrow \pi^+\pi^- \text{ hadrons}$
9902 ± 4 ± 2	10.8k	LEES	11K BABR	$\Upsilon(3S) \rightarrow \eta_b \gamma \pi^0$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
9898.2 ^{+1.1+1.0} _{-1.0-1.1}	50.0k	¹ ADACHI	12 BELL	10.86 $e^+e^- \rightarrow \pi^+\pi^- \text{ MM}$
¹ Superseded by MIZUK 12.				

$h_b(1P)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $\eta_b(1S)\gamma$	(52 ⁺⁶ ₋₅) %

$h_b(1P)$ BRANCHING RATIOS

$\Gamma(\eta_b(1S)\gamma)/\Gamma_{\text{total}}$	Γ_1/Γ			
VALUE (units 10^{-2})	EVTS	DOCUMENT ID	TECN	COMMENT
52⁺⁶₋₅ OUR AVERAGE				
56 ± 8 ± 4	33.1k	¹ TAMPONI	15 BELL	$e^+e^- \rightarrow \gamma\eta + \text{hadrons}$
49.2 ± 5.7 ^{+5.6} _{-3.3}	24k	MIZUK	12 BELL	$e^+e^- \rightarrow (\gamma)\pi^+\pi^- \text{ hadrons}$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	10.8k	LEES	11K BABR	$\Upsilon(3S) \rightarrow \eta_b \gamma \pi^0$
¹ Using $B(\eta \rightarrow 2\gamma) = (39.41 \pm 0.20)\%$.				

$h_b(1P)$ REFERENCES

TAMPONI	15	PRL 115 142001	U. Tamponi <i>et al.</i>	(BELLE Collab.)
ADACHI	12	PRL 108 032001	I. Adachi <i>et al.</i>	(BELLE Collab.)
MIZUK	12	PRL 109 232002	R. Mizuk <i>et al.</i>	(BELLE Collab.)
LEES	11K	PR D84 091101	J.P. Lees <i>et al.</i>	(BABAR Collab.)