

$h_b(2P)$

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

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

 $h_b(2P)$ MASS

| <u>VALUE (MeV)</u> | <u>EVTS</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
|---|-------------|---------------------|-------------|--|
| $10259.8 \pm 0.5 \pm 1.1$ | 90k | ¹ MIZUK | 12 BELL | $e^+e^- \rightarrow \pi^+\pi^-$ hadrons |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● | | | | |
| $10259.8 \pm 0.6^{+1.4}_{-1.0}$ | 83.9k | ² ADACHI | 12 BELL | 10.86 $e^+e^- \rightarrow \pi^+\pi^-$ MM |

¹ Observed with 9 standard deviations significance.

² Superseded by MIZUK 12.

 $h_b(2P)$ DECAY MODES

| Mode | Fraction (Γ_i/Γ) |
|-------------------------------|--------------------------------|
| Γ_1 hadrons | not seen |
| Γ_2 $\eta_b(1S)\gamma$ | (22 ± 5) % |
| Γ_3 $\eta_b(2S)\gamma$ | (48 ± 13) % |

 $h_b(2P)$ BRANCHING RATIOS

| $\Gamma(\text{hadrons})/\Gamma_{\text{total}}$ | | | | Γ_1/Γ |
|--|-------------|--------------------|-------------|---|
| <u>VALUE</u> | <u>EVTS</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
| not seen | 83.9k | ADACHI | 12 BELL | 10.86 $e^+e^- \rightarrow \pi^+\pi^-$ MM |
| $\Gamma(\eta_b(1S)\gamma)/\Gamma_{\text{total}}$ | | | | Γ_2/Γ |
| <u>VALUE (units 10^{-2})</u> | <u>EVTS</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
| $22.3 \pm 3.8^{+3.1}_{-3.3}$ | 10k | MIZUK | 12 BELL | $e^+e^- \rightarrow (\gamma)\pi^+\pi^-$ hadrons |
| $\Gamma(\eta_b(2S)\gamma)/\Gamma_{\text{total}}$ | | | | Γ_3/Γ |
| <u>VALUE (units 10^{-2})</u> | <u>EVTS</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u> |
| $47.5 \pm 10.5^{+6.8}_{-7.7}$ | 26k | MIZUK | 12 BELL | $e^+e^- \rightarrow (\gamma)\pi^+\pi^-$ hadrons |

 $h_b(2P)$ REFERENCES

| | | | | |
|--------|----|----------------|-------------------------|-----------------|
| 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.) |