

**$\Upsilon(10753)$** 

$$J^{PC} = ?(1^{--})$$

## OMITTED FROM SUMMARY TABLE

A candidate for  $\Upsilon(3D)$  state or an exotic structure.Seen by MIZUK 19 in  $e^+e^- \rightarrow \Upsilon(nS)\pi^+\pi^-$  ( $n=1,2,3$ ) with a significance of  $5.2\sigma$ . **$\Upsilon(10753)$  MASS**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b><math>10752.7 \pm 5.9^{+0.7}_{-1.1}</math></b>	<sup>1</sup> MIZUK	19	BELL $e^+e^- \rightarrow \Upsilon(nS)\pi^+\pi^-$

• • • We do not use the following data for averages, fits, limits, etc. • • •

10761 $\pm 2$	<sup>2</sup> DONG	20A	$e^+e^- \rightarrow b\bar{b}$
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<sup>1</sup>From a simultaneous fit to the  $\Upsilon(nS)\pi^+\pi^-$ ,  $n = 1, 2, 3$ , cross sections at 28 energy points within  $\sqrt{s} = 10.63\text{--}11.02$  GeV, including the initial-state radiation at  $\Upsilon(10860)$ .<sup>2</sup>From a fit to the dressed cross sections of AUBERT 09E by BaBar and SANTEL 16 by Belle above 10.68 GeV with a coherent sum of a continuum amplitude and three Breit-Wigner functions with constant widths. **$\Upsilon(10753)$  WIDTH**

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b><math>35.5^{+17.6+3.9}_{-11.3-3.3}</math></b>	<sup>1</sup> MIZUK	19	BELL $e^+e^- \rightarrow \Upsilon(nS)\pi^+\pi^-$

• • • We do not use the following data for averages, fits, limits, etc. • • •

48.5 $\pm 3.0$	<sup>2</sup> DONG	20A	$e^+e^- \rightarrow b\bar{b}$
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<sup>1</sup>From a simultaneous fit to the  $\Upsilon(nS)\pi^+\pi^-$ ,  $n = 1, 2, 3$ , cross sections at 28 energy points within  $\sqrt{s} = 10.63\text{--}11.02$  GeV, including the initial-state radiation at  $\Upsilon(10860)$ .<sup>2</sup>From a fit to the dressed cross sections of AUBERT 09E by BaBar and SANTEL 16 by Belle above 10.68 GeV with a coherent sum of a continuum amplitude and three Breit-Wigner functions with constant widths. **$\Upsilon(10753)$  DECAY MODES**

	Mode
$\Gamma_1$	$\Upsilon(1S)\pi^+\pi^-$
$\Gamma_2$	$\Upsilon(2S)\pi^+\pi^-$
$\Gamma_3$	$\Upsilon(3S)\pi^+\pi^-$
$\Gamma_4$	$e^+e^-$

$\Upsilon(10753) \Gamma(i)\Gamma(e^+e^-)/\Gamma(\text{total})$ 

$$\Gamma(\Upsilon(1S)\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_1\Gamma_4/\Gamma$$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.295 \pm 0.175$	<sup>1,2</sup> MIZUK	19	BELL $e^+e^- \rightarrow \Upsilon(nS)\pi^+\pi^-$
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<sup>1</sup> From a simultaneous fit to the  $\Upsilon(nS)\pi^+\pi^-$ ,  $n = 1, 2, 3$ , cross sections at 28 energy points within  $\sqrt{s} = 10.63\text{--}11.02$  GeV, including the initial-state radiation at  $\Upsilon(10860)$ .

<sup>2</sup> Reported as the range 0.12–0.47 eV obtained from multiple solutions of an amplitude fit within a model composed as a sum of Breit-Wigner functions.

$$\Gamma(\Upsilon(2S)\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_2\Gamma_4/\Gamma$$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.875 \pm 0.345$	<sup>1,2</sup> MIZUK	19	BELL $e^+e^- \rightarrow \Upsilon(nS)\pi^+\pi^-$
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<sup>1</sup> From a simultaneous fit to the  $\Upsilon(nS)\pi^+\pi^-$ ,  $n = 1, 2, 3$ , cross sections at 28 energy points within  $\sqrt{s} = 10.63\text{--}11.02$  GeV, including the initial-state radiation at  $\Upsilon(10860)$ .

<sup>2</sup> Reported as the range 0.53–1.22 eV obtained from multiple solutions of an amplitude fit within a model composed as a sum of Breit-Wigner functions.

$$\Gamma(\Upsilon(3S)\pi^+\pi^-) \times \Gamma(e^+e^-)/\Gamma_{\text{total}} \quad \Gamma_3\Gamma_4/\Gamma$$

VALUE (eV)	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.235 \pm 0.025$	<sup>1,2</sup> MIZUK	19	BELL $e^+e^- \rightarrow \Upsilon(nS)\pi^+\pi^-$
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<sup>1</sup> From a simultaneous fit to the  $\Upsilon(nS)\pi^+\pi^-$ ,  $n = 1, 2, 3$ , cross sections at 28 energy points within  $\sqrt{s} = 10.63\text{--}11.02$  GeV, including the initial-state radiation at  $\Upsilon(10860)$ .

<sup>2</sup> Reported as the range 0.21–0.26 eV obtained from multiple solutions of an amplitude fit within a model composed as a sum of Breit-Wigner functions.

### $\Upsilon(10753)$ REFERENCES

DONG	20A	CP C44 083001	X.-K. Dong <i>et al.</i>	
MIZUK	19	JHEP 1910 220	R. Mizuk <i>et al.</i>	(BELLE Collab.)
SANTEL	16	PR D93 011101	D. Santel <i>et al.</i>	(BELLE Collab.)
AUBERT	09E	PRL 102 012001	B. Aubert <i>et al.</i>	(BABAR Collab.)