

$\Upsilon(10860)$ 

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

## $\Upsilon(10860)$ MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>10876 ± 11</b>	<b>OUR EVALUATION</b>		Weighted-average of Belle and BaBar results, but tripling the scaling $S$ -factors applied to the uncertainties to account for model-dependence, handling of radiative corrections, and interference effects.
• • •	We do not use the following data for averages, fits, limits, etc.	• • •	
10879 ± 3	<sup>1,2</sup> CHEN	10	BELL $e^+e^- \rightarrow$ hadrons
10888.4 <sup>+</sup> <sub>-</sub> $\frac{2.7}{2.6} \pm 1.2$	<sup>3</sup> CHEN	10	BELL $e^+e^- \rightarrow \Upsilon(1S, 2S, 3S)\pi^+\pi^-$
10876 ± 2	<sup>1</sup> AUBERT	09E	BABR $e^+e^- \rightarrow$ hadrons
10869 ± 2	<sup>4</sup> AUBERT	09E	BABR $e^+e^- \rightarrow$ hadrons
10868 ± 6 ± 5	<sup>5</sup> BESSON	85	CLEO $e^+e^- \rightarrow$ hadrons
10845 ± 20	<sup>6</sup> LOVELOCK	85	CUSB $e^+e^- \rightarrow$ hadrons

<sup>1</sup> In a model where a flat non-resonant  $b\bar{b}$ -continuum is incoherently added to a second flat component interfering with two Breit-Wigner resonances. Systematic uncertainties not estimated.

<sup>2</sup> The parameters of the  $\Upsilon(11020)$  are fixed to those in AUBERT 09E.

<sup>3</sup> In a model where a flat nonresonant  $\Upsilon(1S, 2S, 3S)\pi^+\pi^-$  continuum interferes with a single Breit-Wigner resonance.

<sup>4</sup> In a model where a non-resonant  $b\bar{b}$ -continuum represented by a threshold function at  $\sqrt{s}=2m_B$  is incoherently added to a flat component interfering with two Breit-Wigner resonances. Not independent of other AUBERT 09E results. Systematic uncertainties not estimated.

<sup>5</sup> Assuming four Gaussians with radiative tails and a single step in  $R$ .

<sup>6</sup> In a coupled-channel model with three resonances and a smooth step in  $R$ .

## $\Upsilon(10860)$ WIDTH

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>55 ± 28</b>	<b>OUR EVALUATION</b>		Weighted-average of Belle and BaBar results, but tripling the scaling $S$ -factors applied to the uncertainties to account for model-dependence, handling of radiative corrections, and interference effects.
• • •	We do not use the following data for averages, fits, limits, etc.	• • •	
46 <sup>+</sup> <sub>-</sub> $\frac{9}{7}$	<sup>7,8</sup> CHEN	10	BELL $e^+e^- \rightarrow$ hadrons
30.7 <sup>+</sup> <sub>-</sub> $\frac{8.3}{7.0} \pm 3.1$	<sup>9</sup> CHEN	10	BELL $e^+e^- \rightarrow \Upsilon(1S, 2S, 3S)\pi^+\pi^-$
43 ± 4	<sup>7</sup> AUBERT	09E	BABR $e^+e^- \rightarrow$ hadrons
74 ± 4	<sup>10</sup> AUBERT	09E	BABR $e^+e^- \rightarrow$ hadrons
112 ± 17 ± 23	<sup>11</sup> BESSON	85	CLEO $e^+e^- \rightarrow$ hadrons
110 ± 15	<sup>12</sup> LOVELOCK	85	CUSB $e^+e^- \rightarrow$ hadrons

<sup>7</sup> In a model where a flat non-resonant  $b\bar{b}$ -continuum is incoherently added to a second flat component interfering with two Breit-Wigner resonances. Systematic uncertainties not estimated.

<sup>8</sup> The parameters of the  $\Upsilon(11020)$  are fixed to those in AUBERT 09E.

<sup>9</sup> In a model where a flat nonresonant  $\Upsilon(1S, 2S, 3S)\pi^+\pi^-$  continuum interferes with a single Breit-Wigner resonance.

<sup>10</sup> In a model where a non-resonant  $b\bar{b}$ -continuum represented by a threshold function at  $\sqrt{s}=2m_B$  is incoherently added to a flat component interfering with two Breit-Wigner resonances. Not independent of other AUBERT 09E results. Systematic uncertainties not estimated.

<sup>11</sup> Assuming four Gaussians with radiative tails and a single step in  $R$ .

<sup>12</sup> In a coupled-channel model with three resonances and a smooth step in  $R$ .

## $\Upsilon(10860)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Confidence level
$\Gamma_1$ $B\bar{B}X$	( 76.2 $^{+2.7}_{-4.0}$ ) %	
$\Gamma_2$ $B\bar{B}$	( 5.5 $\pm 1.0$ ) %	
$\Gamma_3$ $B\bar{B}^* + \text{c.c.}$	( 13.7 $\pm 1.6$ ) %	
$\Gamma_4$ $B^*\bar{B}^*$	( 38.1 $\pm 3.4$ ) %	
$\Gamma_5$ $B\bar{B}^{(*)}\pi$	< 19.7 %	90%
$\Gamma_6$ $B\bar{B}\pi$	( 0.0 $\pm 1.2$ ) %	
$\Gamma_7$ $B^*\bar{B}\pi + B\bar{B}^*\pi$	( 7.3 $\pm 2.3$ ) %	
$\Gamma_8$ $B^*\bar{B}^*\pi$	( 1.0 $\pm 1.4$ ) %	
$\Gamma_9$ $B\bar{B}\pi\pi$	< 8.9 %	90%
$\Gamma_{10}$ $B_s^{(*)}\bar{B}_s^{(*)}$	( 20.1 $\pm 3.1$ ) %	
$\Gamma_{11}$ $B_s\bar{B}_s$	( 5 $\pm 5$ ) $\times 10^{-3}$	
$\Gamma_{12}$ $B_s\bar{B}_s^* + \text{c.c.}$	( 1.35 $\pm 0.32$ ) %	
$\Gamma_{13}$ $B_s^*\bar{B}_s^*$	( 17.6 $\pm 2.7$ ) %	
$\Gamma_{14}$ no open-bottom	( 3.8 $^{+5.0}_{-0.5}$ ) %	
$\Gamma_{15}$ $e^+e^-$	( 5.6 $\pm 3.1$ ) $\times 10^{-6}$	
$\Gamma_{16}$ $K^*(892)^0\bar{K}^0$	< 1.0 $\times 10^{-5}$	90%
$\Gamma_{17}$ $\Upsilon(1S)\pi^+\pi^-$	( 5.3 $\pm 0.6$ ) $\times 10^{-3}$	
$\Gamma_{18}$ $\Upsilon(2S)\pi^+\pi^-$	( 7.8 $\pm 1.3$ ) $\times 10^{-3}$	
$\Gamma_{19}$ $\Upsilon(3S)\pi^+\pi^-$	( 4.8 $^{+1.9}_{-1.7}$ ) $\times 10^{-3}$	
$\Gamma_{20}$ $\Upsilon(1S)K^+K^-$	( 6.1 $\pm 1.8$ ) $\times 10^{-4}$	
$\Gamma_{21}$ $h_b(1P)\pi^+\pi^-$	( 3.5 $^{+1.0}_{-1.3}$ ) $\times 10^{-3}$	
$\Gamma_{22}$ $h_b(2P)\pi^+\pi^-$	( 6.0 $^{+2.1}_{-1.8}$ ) $\times 10^{-3}$	

### Inclusive Decays.

These decay modes are submodes of one or more of the decay modes above.

$\Gamma_{23}$	$\phi$ anything	( 13.8 $^{+2.4}_{-1.7}$ ) %
$\Gamma_{24}$	$D^0$ anything + c.c.	( 108 $\pm 8$ ) %
$\Gamma_{25}$	$D_s$ anything + c.c.	( 46 $\pm 6$ ) %
$\Gamma_{26}$	$J/\psi$ anything	( 2.06 $\pm 0.21$ ) %
$\Gamma_{27}$	$B^0$ anything + c.c.	( 77 $\pm 8$ ) %
$\Gamma_{28}$	$B^+$ anything + c.c.	( 72 $\pm 6$ ) %

### $\Upsilon(10860)$ PARTIAL WIDTHS

$\Gamma(e^+e^-)$					$\Gamma_{15}$
VALUE (keV)		DOCUMENT ID	TECN	COMMENT	
<b>0.31 <math>\pm 0.07</math> OUR AVERAGE</b>		Error includes scale factor of 1.3.			
0.22 $\pm 0.05$ $\pm 0.07$		BESSON	85	CLEO $e^+e^- \rightarrow$ hadrons	
0.365 $\pm 0.070$		LOVELOCK	85	CUSB $e^+e^- \rightarrow$ hadrons	

### $\Upsilon(10860)$ BRANCHING RATIOS

"OUR EVALUATION" is obtained based on averages of rescaled data listed below. The averages and rescaling were performed by the Heavy Flavor Averaging Group (HFAG) and are described at <http://www.slac.stanford.edu/xorg/hfag/>.

$\Gamma(B\bar{B}X)/\Gamma_{\text{total}}$					$\Gamma_1/\Gamma$
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
<b>0.762<math>^{+0.027}_{-0.043}</math> OUR EVALUATION</b>					
<b>0.71 <math>\pm 0.06</math> OUR AVERAGE</b>					
0.737 $\pm 0.032$ $\pm 0.051$	1063	<sup>13</sup> DRUTSKOY	10	BELL $\Upsilon(5S) \rightarrow B^+X, B^0X$	
0.589 $\pm 0.100$ $\pm 0.092$		<sup>14</sup> HUANG	07	CLEO $\Upsilon(5S) \rightarrow$ hadrons	

$\Gamma(B\bar{B})/\Gamma_{\text{total}}$					$\Gamma_2/\Gamma$
VALUE (units $10^{-2}$ )	CL%	DOCUMENT ID	TECN	COMMENT	
<b>5.5<math>^{+1.0}_{-0.9}</math> <math>\pm 0.4</math></b>		<sup>15</sup> DRUTSKOY	10	BELL $\Upsilon(5S) \rightarrow B^+X, B^0X$	
••• We do not use the following data for averages, fits, limits, etc. •••					
<13.8	90	<sup>14</sup> HUANG	07	CLEO $\Upsilon(5S) \rightarrow$ hadrons	

$\Gamma(B\bar{B})/\Gamma(B\bar{B}X)$					$\Gamma_2/\Gamma_1$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<b>&lt;0.22</b>	90	AQUINES	06	CLE3 $\Upsilon(5S) \rightarrow$ hadrons	

$\Gamma(B\bar{B}^* + \text{c.c.})/\Gamma_{\text{total}}$					$\Gamma_3/\Gamma$
VALUE		DOCUMENT ID	TECN	COMMENT	
<b>0.137<math>\pm 0.016</math> OUR AVERAGE</b>					
0.137 $\pm 0.013$ $\pm 0.011$		<sup>15</sup> DRUTSKOY	10	BELL $\Upsilon(5S) \rightarrow B^+X, B^0X$	
0.143 $\pm 0.053$ $\pm 0.027$		<sup>14</sup> HUANG	07	CLEO $\Upsilon(5S) \rightarrow$ hadrons	

$\Gamma(B\bar{B}^* + \text{c.c.})/\Gamma(B\bar{B}X)$		$\Gamma_3/\Gamma_1$		
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.24±0.09±0.03</b>	10	AQUINES	06 CLE3	$\Upsilon(5S) \rightarrow$ hadrons

$\Gamma(B^*\bar{B}^*)/\Gamma_{\text{total}}$		$\Gamma_4/\Gamma$		
<u>VALUE</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.381±0.034 OUR AVERAGE</b>				
$0.375^{+0.021}_{-0.019} \pm 0.030$		<sup>15</sup> DRUTSKOY	10 BELL	$\Upsilon(5S) \rightarrow B^+ X, B^0 X$
$0.436 \pm 0.083 \pm 0.072$		<sup>14</sup> HUANG	07 CLEO	$\Upsilon(5S) \rightarrow$ hadrons

$\Gamma(B^*\bar{B}^*)/\Gamma(B\bar{B}X)$		$\Gamma_4/\Gamma_1$		
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.74±0.15±0.08</b>	31	AQUINES	06 CLE3	$\Upsilon(5S) \rightarrow$ hadrons

$\Gamma(B\bar{B}^{(*)}\pi)/\Gamma_{\text{total}}$		$\Gamma_5/\Gamma$		
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.197</b>	90	<sup>14</sup> HUANG	07 CLEO	$\Upsilon(5S) \rightarrow$ hadrons

$\Gamma(B\bar{B}^{(*)}\pi)/\Gamma(B\bar{B}X)$		$\Gamma_5/\Gamma_1$		
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.32</b>	90	AQUINES	06 CLE3	$\Upsilon(5S) \rightarrow$ hadrons

$\Gamma(B\bar{B}\pi)/\Gamma_{\text{total}}$		$\Gamma_6/\Gamma$		
<u>VALUE (units 10<sup>-2</sup>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.0±1.2±0.3</b>	0	<sup>15</sup> DRUTSKOY	10 BELL	$\Upsilon(5S) \rightarrow B^{+,0}\pi^- X$

$[\Gamma(B^*\bar{B}\pi) + \Gamma(B\bar{B}^*\pi)]/\Gamma_{\text{total}}$		$\Gamma_7/\Gamma$		
<u>VALUE (units 10<sup>-2</sup>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>7.3^{+2.3}_{-2.1} \pm 0.8</math></b>	38	<sup>15</sup> DRUTSKOY	10 BELL	$\Upsilon(5S) \rightarrow B^{+,0}\pi^- X$

$\Gamma(B^*\bar{B}^*\pi)/\Gamma_{\text{total}}$		$\Gamma_8/\Gamma$		
<u>VALUE (units 10<sup>-2</sup>)</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b><math>1.0^{+1.4}_{-1.3} \pm 0.4</math></b>	5	<sup>15</sup> DRUTSKOY	10 BELL	$\Upsilon(5S) \rightarrow B^{+,0}\pi^- X$

$\Gamma(B\bar{B}\pi\pi)/\Gamma_{\text{total}}$		$\Gamma_9/\Gamma$		
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.089</b>	90	<sup>14</sup> HUANG	07 CLEO	$\Upsilon(5S) \rightarrow$ hadrons

$\Gamma(B\bar{B}\pi\pi)/\Gamma(B\bar{B}X)$		$\Gamma_9/\Gamma_1$		
<u>VALUE</u>	<u>CL%</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>&lt;0.14</b>	90	AQUINES	06 CLE3	$\Upsilon(5S) \rightarrow$ hadrons

$$\Gamma(B_s^{(*)}\bar{B}_s^{(*)})/\Gamma_{\text{total}} \qquad \Gamma_{10}/\Gamma = (\Gamma_{11}+\Gamma_{12}+\Gamma_{13})/\Gamma$$

VALUE DOCUMENT ID TECN COMMENT  
**0.201<sup>+0.030</sup><sub>-0.031</sub> OUR EVALUATION**

**0.189<sup>+0.027</sup><sub>-0.021</sub> OUR AVERAGE**

0.172±0.030      16 ESEN      13 BELL       $\Upsilon(5S) \rightarrow D^0 X, D_s X$

0.21 <sup>+0.06</sup><sub>-0.03</sub>      17 HUANG      07 CLEO       $\Upsilon(5S) \rightarrow D_s X$

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

0.180±0.013±0.032      18 DRUTSKOY      07 BELL       $\Upsilon(5S) \rightarrow D^0 X, D_s X$

0.160±0.026±0.058      19 ARTUSO      05B CLEO       $e^+e^- \rightarrow D_X X$

$$\Gamma(B_s^{(*)}\bar{B}_s^{(*)})/\Gamma(B\bar{B}X) \qquad \Gamma_{10}/\Gamma_1$$

VALUE DOCUMENT ID  
**0.264<sup>+0.052</sup><sub>-0.045</sub> OUR EVALUATION**

$$\Gamma(B_s^*\bar{B}_s^*)/\Gamma(B_s^{(*)}\bar{B}_s^{(*)}) \qquad \Gamma_{13}/\Gamma_{10} = \Gamma_{13}/(\Gamma_{11}+\Gamma_{12}+\Gamma_{13})$$

VALUE (units 10<sup>-2</sup>) EVTS DOCUMENT ID TECN COMMENT  
**87.8±1.5 OUR AVERAGE**

87.0±1.7      20,21 ESEN      13 BELL       $B_s^0 \rightarrow D_s^- \pi^+$

90.5±3.2±0.1      227 21,22 LI      12 BELL       $B_s^0 \rightarrow J/\psi \eta^{(\prime)}$

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

90.1<sup>+3.8</sup><sub>-4.0</sub>±0.2      23 LOUVOT      09 BELL       $10.86 e^+e^- \rightarrow B_s^{(*)}\bar{B}_s^{(*)}$

93 <sup>+7</sup><sub>-9</sub> ±1      23 DRUTSKOY      07A BELL      Superseded by LOUVOT 09

$$\Gamma(B_s\bar{B}_s)/\Gamma(B_s^{(*)}\bar{B}_s^{(*)}) \qquad \Gamma_{11}/\Gamma_{10} = \Gamma_{11}/(\Gamma_{11}+\Gamma_{12}+\Gamma_{13})$$

VALUE (units 10<sup>-2</sup>) DOCUMENT ID TECN COMMENT  
**2.6<sup>+2.6</sup><sub>-2.5</sub>**      LOUVOT      09 BELL       $10.86 e^+e^- \rightarrow B_s^{(*)}\bar{B}_s^{(*)}$

$$\Gamma(B_s\bar{B}_s)/\Gamma(B_s^*\bar{B}_s^*) \qquad \Gamma_{11}/\Gamma_{13}$$

VALUE CL% DOCUMENT ID TECN COMMENT  
**<0.16**      90      BONVICINI      06 CLE3       $e^+e^-$

$$\Gamma(B_s\bar{B}_s^* + \text{c.c.})/\Gamma(B_s^{(*)}\bar{B}_s^{(*)}) \qquad \Gamma_{12}/\Gamma_{10} = \Gamma_{12}/(\Gamma_{11}+\Gamma_{12}+\Gamma_{13})$$

VALUE (units 10<sup>-2</sup>) EVTS DOCUMENT ID TECN COMMENT  
**6.7±1.2 OUR AVERAGE**

7.3±1.4      20,21 ESEN      13 BELL       $B_s^0 \rightarrow D_s^- \pi^+$

4.9±2.5±0.0      227 21,22 LI      12 BELL       $B_s^0 \rightarrow J/\psi \eta^{(\prime)}$

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

7.3<sup>+3.3</sup><sub>-3.0</sub>±0.1      LOUVOT      09 BELL       $10.86 e^+e^- \rightarrow B_s^{(*)}\bar{B}_s^{(*)}$

$\Gamma(B_s \bar{B}_s^* + \text{c.c.})/\Gamma(B_s^* \bar{B}_s^*)$					$\Gamma_{12}/\Gamma_{13}$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<0.16	90	BONVICINI	06	CLE3	$e^+ e^-$

$\Gamma(\text{no open-bottom})/\Gamma_{\text{total}}$		$\Gamma_{14}/\Gamma$
VALUE	DOCUMENT ID	

**0.038<sup>+0.051</sup><sub>-0.005</sub> OUR EVALUATION**

$\Gamma(K^*(892)^0 \bar{K}^0)/\Gamma_{\text{total}}$					$\Gamma_{16}/\Gamma$
VALUE	CL%	DOCUMENT ID	TECN	COMMENT	
<1.0 × 10 <sup>-5</sup>	90	SHEN	13A	BELL	$e^+ e^- \rightarrow K^*(892)^0 \bar{K}^0$

$\Gamma(\Upsilon(1S)\pi^+\pi^-)/\Gamma_{\text{total}}$					$\Gamma_{17}/\Gamma$
VALUE (units 10 <sup>-3</sup> )	EVTS	DOCUMENT ID	TECN	COMMENT	
5.3 ± 0.3 ± 0.5	325	24 CHEN	08	BELL	10.87 $e^+ e^- \rightarrow \Upsilon(1S)\pi^+\pi^-$

$\Gamma(\Upsilon(2S)\pi^+\pi^-)/\Gamma_{\text{total}}$					$\Gamma_{18}/\Gamma$
VALUE (units 10 <sup>-3</sup> )	EVTS	DOCUMENT ID	TECN	COMMENT	
7.8 ± 0.6 ± 1.1	186	24 CHEN	08	BELL	10.87 $e^+ e^- \rightarrow \Upsilon(2S)\pi^+\pi^-$

$\Gamma(\Upsilon(3S)\pi^+\pi^-)/\Gamma_{\text{total}}$					$\Gamma_{19}/\Gamma$
VALUE (units 10 <sup>-3</sup> )	EVTS	DOCUMENT ID	TECN	COMMENT	
4.8 <sup>+1.8</sup> <sub>-1.5</sub> ± 0.7	10	24 CHEN	08	BELL	10.87 $e^+ e^- \rightarrow \Upsilon(3S)\pi^+\pi^-$

$\Gamma(\Upsilon(1S)K^+K^-)/\Gamma_{\text{total}}$					$\Gamma_{20}/\Gamma$
VALUE (units 10 <sup>-4</sup> )	EVTS	DOCUMENT ID	TECN	COMMENT	
6.1 <sup>+1.6</sup> <sub>-1.4</sub> ± 1.0	20	24 CHEN	08	BELL	10.87 $e^+ e^- \rightarrow \Upsilon(1S)K^+K^-$

$\Gamma(h_b(1P)\pi^+\pi^-)/\Gamma(\Upsilon(2S)\pi^+\pi^-)$					$\Gamma_{21}/\Gamma_{18}$
VALUE		DOCUMENT ID	TECN	COMMENT	
0.45 ± 0.08 <sup>+0.07</sup> <sub>-0.12</sub>		ADACHI	12	BELL	10.86 $e^+ e^- \rightarrow \text{hadrons}$

$\Gamma(h_b(2P)\pi^+\pi^-)/\Gamma(\Upsilon(2S)\pi^+\pi^-)$					$\Gamma_{22}/\Gamma_{18}$
VALUE		DOCUMENT ID	TECN	COMMENT	
0.77 ± 0.08 <sup>+0.22</sup> <sub>-0.17</sub>		ADACHI	12	BELL	10.86 $e^+ e^- \rightarrow \text{hadrons}$

$\Gamma(\phi \text{ anything})/\Gamma_{\text{total}}$					$\Gamma_{23}/\Gamma$
VALUE		DOCUMENT ID	TECN	COMMENT	
0.138 ± 0.007 <sup>+0.023</sup> <sub>-0.015</sub>		HUANG	07	CLEO	$\Upsilon(5S) \rightarrow \phi X$

$\Gamma(D^0 \text{ anything} + \text{c.c.})/\Gamma_{\text{total}}$					$\Gamma_{24}/\Gamma$
VALUE		DOCUMENT ID	TECN	COMMENT	
1.076 ± 0.040 ± 0.068		DRUTSKOY	07	BELL	$\Upsilon(5S) \rightarrow D^0 X$

$\Gamma(D_s \text{ anything} + \text{c.c.})/\Gamma_{\text{total}}$				$\Gamma_{25}/\Gamma$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b>0.46 ± 0.06 OUR AVERAGE</b>				
0.472 ± 0.024 ± 0.072	<sup>18</sup> DRUTSKOY 07	BELL	$\Upsilon(5S) \rightarrow D_s X$	
0.44 ± 0.09 ± 0.04	<sup>25</sup> ARTUSO 05B	CLE3	$e^+ e^- \rightarrow D_s X$	

$\Gamma(J/\psi \text{ anything})/\Gamma_{\text{total}}$				$\Gamma_{26}/\Gamma$
<u>VALUE (units 10<sup>-2</sup>)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b>2.060 ± 0.160 ± 0.134</b>	DRUTSKOY 07	BELL	$\Upsilon(5S) \rightarrow J/\psi X$	

$\Gamma(B^0 \text{ anything} + \text{c.c.})/\Gamma_{\text{total}}$				$\Gamma_{27}/\Gamma$
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.770<sup>+0.058</sup><sub>-0.056</sub> ± 0.061</b>	352	DRUTSKOY 10	BELL	$\Upsilon(5S) \rightarrow B^0 X$

$\Gamma(B^+ \text{ anything} + \text{c.c.})/\Gamma_{\text{total}}$				$\Gamma_{28}/\Gamma$
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.721<sup>+0.039</sup><sub>-0.038</sub> ± 0.050</b>	711	DRUTSKOY 10	BELL	$\Upsilon(5S) \rightarrow B^+ X$

<sup>13</sup> Not independent of DRUTSKOY 10 values for  $\Upsilon(5S) \rightarrow B^{\pm,0}$  anything.

<sup>14</sup> Using measurements or limits from AQUINES 06.

<sup>15</sup> Assuming isospin conservation.

<sup>16</sup> Supersedes DRUTSKOY 07.

<sup>17</sup> Supersedes ARTUSO 05B. Combining inclusive  $\phi$ ,  $D_s$ , and  $B$  measurements. Using  $B(D_s^+ \rightarrow \phi\pi^+) = 4.4 \pm 0.6\%$  from PDG 06.

<sup>18</sup> Using  $B(D_s^+ \rightarrow \phi\pi^+) = (4.4 \pm 0.6)\%$  from PDG 06.

<sup>19</sup> Uses a model-dependent estimate  $B(B_s \rightarrow D_s X) = (92 \pm 11)\%$ .

<sup>20</sup> Supersedes LOUVOT 09.

<sup>21</sup> With  $N(B_s^{(*)}\bar{B}_s^{(*)}) = (7.11 \pm 1.30) \times 10^6$ .

<sup>22</sup> The ratios  $N(B_s^*\bar{B}_s^*) / N(B_s^{(*)}\bar{B}_s^{(*)})$  and  $N(B_s^*\bar{B}_s^0) / N(B_s^{(*)}\bar{B}_s^{(*)})$  are measured with a correlation coefficient of  $-0.72$ .

<sup>23</sup> From a measurement of  $\sigma(e^+e^- \rightarrow B_s^*\bar{B}_s^*) / \sigma(e^+e^- \rightarrow B_s^{(*)}\bar{B}_s^{(*)})$  at  $\sqrt{s} = 10.86$  GeV.

<sup>24</sup> Assuming that the observed events are solely due to the  $\Upsilon(5S)$  resonance.

<sup>25</sup> ARTUSO 05B reports  $[\Gamma(\Upsilon(10860) \rightarrow D_s \text{ anything} + \text{c.c.})/\Gamma_{\text{total}}] \times [B(D_s^+ \rightarrow \phi\pi^+)] = 0.0198 \pm 0.0019 \pm 0.0038$  which we divide by our best value  $B(D_s^+ \rightarrow \phi\pi^+) = (4.5 \pm 0.4) \times 10^{-2}$ . Our first error is their experiment's error and our second error is the systematic error from using our best value.

## $\Upsilon(10860)$ REFERENCES

ESEN	13	PR D87 031101	S. Esen <i>et al.</i>	(BELLE Collab.)
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