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

### $\psi$ (4415) MASS

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
4421 ± 4 OUR ESTIMA	TE		
4415.1± 7.9	$^{ m 1}$ ABLIKIM	08D BES2	$e^+e^- o$ hadrons
• • • We do not use the foll	owing data for av	erages, fits, li	mits, etc. • • •
4412 ±15			$e^+e^- o$ hadrons
$4411 \pm 7$			10.6 $e^+e^- \to D^0D^-\pi^+\gamma$
$4425 \pm 6$			$e^+e^-  ightarrow $ hadrons
$4429 \pm 9$	<sup>5</sup> SETH	05A RVUE	$e^+e^-  ightarrow $ hadrons
4417 $\pm 10$	BRANDELIK	78C DASP	$e^+e^-$
$4414 \pm 7$	SIEGRIST	76 MRK1	$e^+e^-$

 $<sup>^1</sup>$  Reanalysis of data presented in BAI 02C. From a global fit over the center-of-mass energy region 3.7–5.0 GeV covering the  $\psi(3770),~\psi(4040),~\psi(4160),$  and  $\psi(4415)$  resonances. Phase angle fixed in the fit to  $\delta=(234\pm88)^{\circ}$ .

#### $\psi$ (4415) WIDTH

<i>VALUE</i> (MeV)	DOCUMENT ID	TECN	COMMENT
62 ±20 OUR ESTI			
$71.5 \pm 19.0$	<sup>6</sup> ABLIKIM	08D BES2	$e^+e^- o$ hadrons
• • • We do not use th	e following data for av	erages, fits, li	mits, etc. • • •
118 ±32	<sup>7</sup> MO	10 RVUE	$e^+e^- o$ hadrons
$77 \pm 20$	<sup>8</sup> PAKHLOVA	08A BELL	10.6 e <sup>+</sup> e <sup>-</sup> $\rightarrow D^0 D^- \pi^+ \gamma$
$119 \pm 16$			$e^+e^- o$ hadrons
$118 \pm 35$	<sup>10</sup> SЕТН	05A RVUE	$e^+e^- o$ hadrons
$66 \pm 15$	BRANDELIK		
$33 \pm 10$	SIEGRIST	76 MRK1	$e^+e^-$
			c over the center-of-mass energy $\psi(4415)$ resonances.

Phase angle fixed in the fit to  $\delta = (234 \pm 88)^{\circ}$ .

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<sup>&</sup>lt;sup>2</sup>Reanalysis of data presented in BAI 00 and BAI 02C. From a global fit over the centerof-mass energy 3.8-4.8 GeV covering the  $\psi(4040)$ ,  $\psi(4160)$  and  $\psi(4415)$  resonances and including interference effects.

<sup>&</sup>lt;sup>3</sup> Systematic uncertainties not estimated.

<sup>&</sup>lt;sup>4</sup> From a fit to Crystal Ball (OSTERHELD 86) data.

<sup>&</sup>lt;sup>5</sup> From a fit to BES (BAI 02C) data.

<sup>&</sup>lt;sup>7</sup> Reanalysis of data presented in BAI 00 and BAI 02C. From a global fit over the center-of-mass energy 3.8-4.8 GeV covering the  $\psi(4040)$ ,  $\psi(4160)$  and  $\psi(4415)$  resonances and including interference effects.

<sup>&</sup>lt;sup>8</sup> Systematic uncertainties not estimated.

<sup>&</sup>lt;sup>9</sup> From a fit to Crystal Ball (OSTERHELD 86) data.

<sup>&</sup>lt;sup>10</sup> From a fit to BES (BAI 02C) data.

### $\psi$ (4415) DECAY MODES

Due to the complexity of the  $c\overline{c}$  threshold region, in this listing, "seen" ("not seen") means that a cross section for the mode in question has been measured at effective  $\sqrt{s}$  near this particle's central mass value, more (less) than  $2\sigma$  above zero, without regard to any peaking behavior in  $\sqrt{s}$  or absence thereof. See mode listing(s) for details and references.

	Mode	Fraction $(\Gamma_i/\Gamma)$	Confidence level
$\overline{\Gamma_1}$	$D\overline{D}$	seen	
$\Gamma_2^-$	$D^0 \overline{D}{}^0$	seen	
Γ <sub>3</sub>	$D^+D^-$	seen	
$\Gamma_4$	$D^*\overline{D}$ + c.c.	seen	
$\Gamma_5$	$D^*(2007)^0  \overline{D}{}^0 + { m c.c.}$	seen	
$\Gamma_6$	$D^*(2010)^+D^-+$ c.c.	seen	
$\Gamma_7$	$D^*\overline{D}^*$	seen	
U	$D^*(2007)^0 \overline{D}^*(2007)^0 + \text{c.c.}$	seen	
$\Gamma_9$	$D^*(2010)^+D^*(2010)^- + c.c.$	seen	
$\Gamma_{10}$	$D^0 D^- \pi^+ (\text{excl. } D^* (2007)^0 \overline{D}{}^0$	< 2.3 %	90%
	$_{-}$ +c.c., $D^{*}(2010)^{+}D^{-}$ +c.c.		
$\Gamma_{11}$	$D\overline{D}_{2}^{*}(2460) \to D^{0}D^{-}\pi^{+}+c.c.$	(10 $\pm 4$ ) %	
$\Gamma_{12}$	$D^{0}D^{*-}\pi^{+}$ +c.c.	< 11 %	90%
$\Gamma_{13}$	$D_s^+ D_s^-$	not seen	
$\Gamma_{14}$	$\omega \chi_{c2}$	possibly seen	
$\Gamma_{15}$	$D_{s}^{*+}D_{s}^{-}+\text{c.c.}$	seen	
	$D_s^{*+}D_s^{*-}$	not seen	
Γ <sub>17</sub>	$\psi(3823)\pi^{+}\pi^{-}$	possibly seen	
	$J/\psi \eta$	< 6 × 10 <sup>-</sup>	3 90%
	$\chi_{c1}\gamma$	< 8 × 10 <sup>-1</sup>	4 90%
	$\chi_{c2}\gamma$	< 4 × 10 <sup>-</sup>	3 90%
$\Gamma_{21}^{-3}$	$e^+e^-$	$(9.4\pm3.2)\times10^{-1}$	6

## $\psi$ (4415) PARTIAL WIDTHS

$\Gamma(e^+e^-)$					Γ <sub>21</sub>
VALUE (keV)	DOCUMENT ID		TECN	COMMENT	
$0.58\pm0.07$ OUR ESTIMATE					
$0.35 \pm 0.12$	<sup>11</sup> ABLIKIM	<b>08</b> D	BES2	$e^+e^-$	hadrons
• • • We do not use the followi	ng data for average	s, fits,	limits, e	etc. • • •	
0.4 to 0.8	<sup>12</sup> MO	10	RVUE	$e^+e^- \rightarrow$	hadrons
$0.72 \pm 0.11$	<sup>13</sup> SETH	05A	RVUE	$e^+e^-$	hadrons
$0.64 \pm 0.23$	<sup>14</sup> SETH	05A	RVUE	$e^+e^-$	hadrons
$0.49 \pm 0.13$	BRANDELIK	<b>78</b> C	DASP	$e^+e^-$	
$0.44 \pm 0.14$	SIEGRIST	76	MRK1	$e^+e^-$	

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# $\psi$ (4415) $\Gamma$ (i) $\times \Gamma$ ( $e^+e^-$ )/ $\Gamma$ (total)

	φ(::=σ)	. (.) / . (0 0	"	(5552.)	
$\Gamma(J/\psi\eta) \times \Gamma(e^+e^-)$		DOCUMENT ID		TECN	$\Gamma_{18}\Gamma_{21}/\Gamma_{18}$
<u>VALUE</u> (eV) <b>&lt;3.6</b>		DOCUMENT ID WANG			$e^+e^- \rightarrow J/\psi \eta \gamma$
		***	100	DELL	
$\Gamma(\chi_{c1}\gamma) \times \Gamma(e^+e^-$	*				Γ <sub>19</sub> Γ <sub>21</sub> /Γ
VALUE (eV)	_ <u>CL%</u>	DOCUMENT ID			
<b>&lt;0.47</b>			15	RELL	10.58 $e^+e^- \rightarrow \chi_{c1}\gamma$
$^{15}$ Using B $(\eta  ightarrow \gamma \gamma)$ =	$= (39.41 \pm 0)$	0.21)%.			
$\Gamma(\chi_{c2}\gamma) \times \Gamma(e^+e^-$	)/F <sub>total</sub>				$\Gamma_{20}\Gamma_{21}/\Gamma_{21}$
VALUE (eV)	CL%	DOCUMENT ID		TECN	COMMENT
			15	BELL	10.58 $e^+e^- \rightarrow \chi_{c2}\gamma$
$^{16}$ Using B $(\eta  ightarrow \gamma \gamma)$ =	= (39.41 ±	0.21)%.			
	1/444=1		<u> </u>	<b>T</b> 100	
	$\psi$ (4415)	BRANCHIN	G KA	11105	
$\Gamma igl( D^0  \overline{D}{}^0 igr) / \Gamma_{total}$					Γ <sub>2</sub> /Γ
VALUE		DOCUMENT ID		TECN	COMMENT
seen		PAKHLOVA			$e^+e^-  ightarrow D^0 \overline{D}{}^0 \gamma$
• • • We do not use the	e following o				
not seen		AUBERT	09м	BABR	$e^+e^-  ightarrow D^0 \overline{D}{}^0 \gamma$
$\Gamma(D^+D^-)/\Gamma_{\text{total}}$					Γ <sub>3</sub> /Γ
VALUE		DOCUMENT ID		TECN	•,
seen		PAKHLOVA	80	BELL	$e^+e^- \rightarrow D^+D^-\gamma$
• • • We do not use the	following o	lata for averages			
not seen		AUBERT	09м	BABR	$e^+e^- \rightarrow D^+D^-\gamma$
$\Gamma(D\overline{D})/\Gamma(D^*\overline{D}^*)$					$\Gamma_1/\Gamma_7$
VALUE		DOCUMENT ID		TECN	<u>COMMENT</u>
0.14±0.12±0.03					$e^+e^-  ightarrow \gamma D^{(*)} \overline{D}^{(*)}$
E(D*(0007\0 <u>70</u> )	- ) /⊏				- /-
$\Gamma(D^*(2007)^0\overline{D}^0+c.$	C.)/I total	DOCUMENT ID		TECN	Γ <sub>5</sub> /Γ
VALUE		DOCUMENT ID AUBERT	0014	TECN BARR	$ \frac{COMMENT}{e^+e^- \rightarrow D^{*0} \overline{D}{}^0 \gamma} $
seen		AUDEI/ I	USIVI	אטוע	$e e \rightarrow D D \gamma$
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 $<sup>^{11}</sup>$  Reanalysis of data presented in BAI 02C. From a global fit over the center-of-mass energy region 3.7–5.0 GeV covering the  $\psi(3770),\,\psi(4040),\,\psi(4160),$  and  $\psi(4415)$  resonances. Phase angle fixed in the fit to  $\delta=(234\pm88)^\circ$  .

 $<sup>^{12}</sup>$  Reanalysis of data presented in BAI 00 and BAI 02C. From a global fit over the center-of-mass energy 3.8-4.8 GeV covering the  $\psi(4040),\;\psi(4160)$  and  $\psi(4415)$  resonances and including interference effects. Four sets of solutions are obtained with the same fit quality, mass and total width, but with different  $e^+e^-$  partial widths. We quote only the range of values.

<sup>13</sup> From a fit to Crystal Ball (OSTERHELD 86) data.

<sup>&</sup>lt;sup>14</sup> From a fit to BES (BAI 02C) data.

	$/\Gamma_{ m total}$			Γ <sub>6</sub> /Γ
VALUE	<u>DOCUMENT ID</u>			
seen	AUBERT			$e^+e^- \rightarrow D^{*+}D^-\gamma$
seen	PAKHLOVA	07	BELL	$e^+e^- \rightarrow D^{*+}D^-\gamma$
$\Gamma(D^*\overline{D} + \text{c.c.})/\Gamma(D^*\overline{D}^*$	·)			$\Gamma_4/\Gamma_7$
VALUE	<u>DOCUMENT ID</u>			COMMENT
$0.17 \pm 0.25 \pm 0.03$	AUBERT	09м	BABR	$e^+e^- \rightarrow \gamma D^{(*)} \overline{D}^{(*)}$
$\Gamma(D^*(2007)^0 \overline{D}^*(2007)^0$	,			Γ <sub>8</sub> /Γ
<i>Value</i> <b>seen</b>	<u>DOCUMENT ID</u> AUBERT	0014	RARR	$ \frac{COMMENT}{e^+e^- \rightarrow D^{*0}\overline{D}^{*0}\gamma} $
		USIVI	DADIN	$e \cdot e \rightarrow D \cdot D \cdot \gamma$
$\Gamma(D^*(2010)^+D^*(2010)^-$				Г <sub>9</sub> /Г
VALUE	·			COMMENT
seen	AUBERT			$e^+e^- \rightarrow D^{*+}D^{*-}\gamma$
<b>seen</b>	PAKHLOVA	07	BELL	$e^+e^- \rightarrow D^{*+}D^{*-}\gamma$
$\Gamma(D\overline{D}_2^*(2460) \to D^0D^-$	$\pi^+$ +c.c.)/ $\Gamma_{ ext{total}}$			Γ <sub>11</sub> /Γ
VALUE (units $10^{-2}$ )	DOCUMENT ID	TECN	СОМІ	MENT
10.5±2.4±3.8	<sup>17</sup> PAKHLOVA 08A	BELI	10.6	$e^+e^-  ightarrow D^0D^-\pi^+\gamma$
$^{17}$ Using 4421 $\pm$ 4 MeV for	the mass and 62 $\pm$ 20	MeV	for the v	width of $\psi$ (4415).
	$\pi^+$ +c.c.)			
<b>&lt;0.22</b> 90 18 Using 4421 ± 4 MeV for	$\frac{DOCUMENT\ ID}{18}$ PAKHLOVA 08A the mass and 62 $\pm$ 20	BELI MeV	10.6	$rac{MENT}{e^+e^- ightarrow\ D^0D^-\pi^+\gamma}$ width of $\psi$ (4415).
<b>&lt;0.22</b> 90 $^{18}$ Using $4421 \pm 4$ MeV for $\Gamma(D^0D^{*-}\pi^+ + \text{c.c.})/\Gamma_{tc}$	$\frac{DOCUMENT\ ID}{18\ PAKHLOVA}$ 08A the mass and 62 $\pm$ 20	BELI MeV <b>otal</b>	_ 10.6 for the v	width of $\psi$ (4415). $\Gamma_{12}/\Gamma \times \Gamma_{21}/\Gamma$
<b>&lt;0.22</b> 90 $^{18} \text{ Using } 4421 \pm 4 \text{ MeV for}$ $\Gamma(D^0 D^{*-} \pi^+ + \text{c.c.}) / \Gamma_{\text{to}}$ $VALUE \qquad CL$	$\frac{DOCUMENT\ ID}{18\ PAKHLOVA}$ 08A the mass and 62 $\pm$ 20 that $ imes$ $\Gamma(e^+e^-)/\Gamma_{tc}$ $\frac{DOCUMENT\ ID}{18}$	BELI MeV	_ 10.6 for the v 	width of $\psi$ (4415). $\Gamma_{12}/\Gamma \times \Gamma_{21}/\Gamma$
<0.22 90 $^{18} \text{ Using } 4421 \pm 4 \text{ MeV for}$ $\Gamma(D^0 D^{*-} \pi^+ + \text{c.c.}) / \Gamma_{\text{to}}$ VALUE CL	$\begin{array}{c} \underline{DOCUMENT\ ID} \\ 18\ \mathrm{PAKHLOVA} & 08\mathrm{A} \\ \mathrm{the\ mass\ and} & 62\pm20 \\ \underline{\mathrm{otal}} & \times & \Gamma(e^+e^-)/\Gamma_{\mathrm{tc}} \\ \underline{0DOCUMENT\ ID} \\ 19\ \mathrm{PAKHLOVA} \end{array}$	BELI MeV	_ 10.6 for the v 	MENT $e^+e^-  o D^0D^-\pi^+\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma  imes \Gamma_{21}/\Gamma$ COMMENT
<b>&lt;0.22</b> 90 $^{18}$ Using $^{4421} \pm ^{4}$ MeV for $\Gamma(D^{0}D^{*-}\pi^{+} + \text{c.c.})/\Gamma_{\text{total}}$ $^{6}$ $^{6}$ $^{6}$ $^{19}$ Using $^{6}$ $^{19}$ Using $^{6}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$	$\frac{DOCUMENT\ ID}{18\ PAKHLOVA}$ 08A the mass and 62 $\pm$ 20 thal $\times$ $\Gamma(e^+e^-)/\Gamma_{tc}$ $\frac{DOCUMENT\ ID}{19\ PAKHLOVA}$ the mass of $\psi(4415)$ .	BELI MeV <b>otal</b> 09	_ 10.6 for the v <u>TECN</u> BELL	MENT $e^+e^-  o D^0D^-\pi^+\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma  imes \Gamma_{21}/\Gamma$ $\frac{COMMENT}{e^+e^-  o D^0D^{*-}\pi^+}$ $\Gamma_{13}/\Gamma$
<b>&lt;0.22</b> 90 $^{18}$ Using $^{4421} \pm 4$ MeV for $\Gamma(D^0D^{*-}\pi^+ + \text{c.c.})/\Gamma_{\text{tot}}$ $^{6}$ $^{6}$ $^{6}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$ $^{7}$	$\frac{DOCUMENT\ ID}{18\ PAKHLOVA}$ 08A the mass and 62 $\pm$ 20 thal $\times$ $\Gamma(e^+e^-)/\Gamma_{tc}$ $\frac{DOCUMENT\ ID}{19\ PAKHLOVA}$ the mass of $\psi(4415)$ .	BELI MeV <b>otal</b> 09	_ 10.6 for the v <u>TECN</u> BELL	MENT $e^+e^-  o D^0D^-\pi^+\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma  imes \Gamma_{21}/\Gamma$ $\frac{COMMENT}{e^+e^-  o D^0D^{*-}\pi^+}$ $\Gamma_{13}/\Gamma$
<b>&lt;0.22</b> 90 <sup>18</sup> Using $4421 \pm 4$ MeV for $\Gamma(D^0D^{*-}\pi^+ + c.c.)/\Gamma_{tc}$ (0.99 × 10 <sup>-6</sup> 90  19 Using $4421 \pm 4$ MeV for $\Gamma(D_s^+D_s^-)/\Gamma_{total}$ (ALUE	$\begin{array}{c} \underline{DOCUMENT\ ID} \\ 18\ \mathrm{PAKHLOVA} & 08\mathrm{A} \\ \mathrm{the\ mass\ and\ } 62\pm20 \\ \mathrm{ptal} & \times & \Gamma(e^+e^-)/\Gamma_{\mathrm{tc}} \\ \underline{\%} & \underline{DOCUMENT\ ID} \\ 19\ \mathrm{PAKHLOVA} \\ \mathrm{the\ mass\ of\ } \psi(4415). \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \end{array}$	BELI MeV otal 09	TECN BELL  TECN BELL	MENT $e^+e^-  o D^0D^-\pi^+\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma  imes \Gamma_{21}/\Gamma$ $\frac{COMMENT}{e^+e^-  o D^0D^{*-}\pi^+}$ $\frac{COMMENT}{e^+e^-  o D^+D^-\gamma}$
$< 0.22$ 90 $^{18}$ Using $4421 \pm 4$ MeV for $\Gamma(D^0D^{*-}\pi^+ + c.c.)/\Gamma_{tc}$ $< 0.99 \times 10^{-6}$ 90 $^{19}$ Using $4421 \pm 4$ MeV for $\Gamma(D_s^+D_s^-)/\Gamma_{total}$ $VALUE$ not seen	$\begin{array}{c} \underline{DOCUMENT\ ID} \\ 18\ \mathrm{PAKHLOVA} & 08\mathrm{A} \\ \mathrm{the\ mass\ and\ } 62\pm20 \\ \mathrm{ptal} & \times & \Gamma(e^+e^-)/\Gamma_{\mathrm{tc}} \\ \underline{\%} & \underline{DOCUMENT\ ID} \\ 19\ \mathrm{PAKHLOVA} \\ \mathrm{the\ mass\ of\ } \psi(4415). \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \end{array}$	BELI MeV otal 09	TECN BELL  TECN BELL	MENT $e^+e^-  o D^0D^-\pi^+\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma  imes \Gamma_{21}/\Gamma$ $\frac{COMMENT}{e^+e^-  o D^0D^{*-}\pi^+}$ $\Gamma_{13}/\Gamma$
$<0.22$ 90 $^{18}$ Using $4421 \pm 4$ MeV for $\Gamma(D^0D^{*-}\pi^+ + c.c.)/\Gamma_{tc}$ $<0.99 \times 10^{-6}$ 90 $^{19}$ Using $4421 \pm 4$ MeV for $\Gamma(D_s^+D_s^-)/\Gamma_{total}$ $VALUE$ not seen $\Gamma(\omega\chi_{c2})/\Gamma_{total}$	$DOCUMENT\ ID$ 18 PAKHLOVA 08A  18 the mass and 62 $\pm$ 20  19 PAKHLOVA  19 PAKHLOVA  19 the mass of $\psi$ (4415).  10 PAKHLOVA  10 PAKHLOVA  11 PAKHLOVA	BELI MeV otal 09	for the volume of the volume o	width of $\psi$ (4415). $\Gamma_{12}/\Gamma \times \Gamma_{21}/\Gamma$ $COMMENT$ $e^{+}e^{-} \rightarrow D^{0}D^{-}\pi^{+}\gamma$ $COMMENT$ $e^{+}e^{-} \rightarrow D^{0}D^{*-}\pi^{+}$ $\Gamma_{13}/\Gamma$ $COMMENT$ $e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma$ $e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma$ $\Gamma_{14}/\Gamma$
$^{6}$ Value $^{18}$ Using $^{4421}$ $\pm$ 4 MeV for $^{18}$ Using $^{4421}$ $\pm$ 4 MeV for $^{18}$ Value $^{19}$ Using $^{4421}$ $\pm$ 4 MeV for $^{19}$ Using $^{4421}$ $\pm$ 4 MeV for $^{19}$ Using $^{1$	$DOCUMENT\ ID$ 18 PAKHLOVA 08A  18 the mass and 62 $\pm$ 20  19 PAKHLOVA  19 PAKHLOVA  19 the mass of $\psi$ (4415).  10 PAKHLOVA  10 PAKHLOVA  11 PAKHLOVA	BELI MeV otal 09	for the volume of the volume o	MENT $e^{+}e^{-} \rightarrow D^{0}D^{-}\pi^{+}\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma \times \Gamma_{21}/\Gamma$ $\frac{COMMENT}{e^{+}e^{-} \rightarrow D^{0}D^{*-}\pi^{+}}$ $\Gamma_{13}/\Gamma$ $\frac{COMMENT}{e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma}$ $e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma$ $\Gamma_{14}/\Gamma$
$^{6}$ $^{18}$ Using $^{4421}$ $\pm$ 4 MeV for $^{18}$ Using $^{4421}$ $\pm$ 4 MeV for $^{18}$ $^{18}$ Using $^{19}$ $^{19}$ Using $^{4421}$ $\pm$ 4 MeV for $^{19}$ Using $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$ $^{19}$	$DOCUMENT\ ID$ 18 PAKHLOVA 08A  18 the mass and 62 $\pm$ 20  19 PAKHLOVA  19 PAKHLOVA  19 the mass of $\psi$ (4415).  10 PAKHLOVA  10 PAKHLOVA  11 PAKHLOVA	BELI MeV otal 09	for the volume of the volume o	MENT $e^{+}e^{-} \rightarrow D^{0}D^{-}\pi^{+}\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma \times \Gamma_{21}/\Gamma$ $\frac{COMMENT}{e^{+}e^{-} \rightarrow D^{0}D^{*-}\pi^{+}}$ $\Gamma_{13}/\Gamma$ $\frac{COMMENT}{e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma}$ $e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma$ $\Gamma_{14}/\Gamma$
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**Note that the second representation of the	$\begin{array}{c} \underline{DOCUMENT\ ID} \\ 18\ \mathrm{PAKHLOVA} & 08\mathrm{A} \\ \mathrm{the\ mass\ and\ } 62\pm20 \\ \underline{DOCUMENT\ ID} \\ 19\ \mathrm{PAKHLOVA} \\ \mathrm{The\ mass\ of\ } \psi(4415). \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \mathrm{DEL-AMO-SA} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{ABLIKIM} \\ 16\mathrm{A} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{ABLIKIM} \\ 16\mathrm{A} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \\ \underline{DOCUMENT\ ID} \\ \\ DOCUMENT\ ID$	9 1110N BES3	TECN BELL BABR  C COMI BELL  TECN BELL BABR	MENT $e^{+}e^{-} \rightarrow D^{0}D^{-}\pi^{+}\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma \times \Gamma_{21}/\Gamma$ $COMMENT$ $e^{+}e^{-} \rightarrow D^{0}D^{*-}\pi^{+}$ $\Gamma_{13}/\Gamma$ $COMMENT$ $e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma$ $e^{+}e^{-} \rightarrow D_{s}^{+}D_{s}^{-}\gamma$ $\Gamma_{14}/\Gamma$ $MENT$ $- \rightarrow \gamma\pi^{+}\pi^{-}\pi^{0}\ell^{+}\ell^{-}$ $\Gamma_{15}/\Gamma$ $COMMENT$ $e^{+}e^{-} \rightarrow D_{s}^{*+}D_{s}^{-}\gamma$
<b>&lt;0.22</b> 90 $^{18}$ Using $^{4421} \pm ^{4}$ MeV for $\Gamma(D^0D^{*-}\pi^+ + \text{c.c.})/\Gamma_{te}$ $^{VALUE}$ $^{<0.99} \times 10^{-6}$ 90	$\begin{array}{c} \underline{DOCUMENT\ ID} \\ 18\ \mathrm{PAKHLOVA} & 08\mathrm{A} \\ \mathrm{the\ mass\ and\ } 62\pm20 \\ \underline{DOCUMENT\ ID} \\ 19\ \mathrm{PAKHLOVA} \\ \mathrm{The\ mass\ of\ } \psi(4415). \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \mathrm{DEL-AMO-SA} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{ABLIKIM} \\ 16\mathrm{A} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{ABLIKIM} \\ 16\mathrm{A} \\ \\ \underline{DOCUMENT\ ID} \\ \mathrm{PAKHLOVA} \\ \\ \underline{DOCUMENT\ ID} \\ \\ DOCUMENT\ ID$	9 1110N BES3	TECN BELL BABR  C COMI BELL  TECN BELL BABR	MENT $e^+e^-  o D^0D^-\pi^+\gamma$ width of $\psi$ (4415). $\Gamma_{12}/\Gamma  imes \Gamma_{21}/\Gamma$ $COMMENT$ $e^+e^-  o D^0D^{*-}\pi^+$ $F_{13}/\Gamma$ $COMMENT$ $e^+e^-  o D_s^+D_s^-\gamma$ $e^+e^-  o D_s^+D_s^-\gamma$ $\Gamma_{14}/\Gamma$ $MENT$ $-  o \gamma\pi^+\pi^-\pi^0\ell^+\ell^-$ $\Gamma_{15}/\Gamma$

$\Gamma(D_s^{*+}D_s^{*-})/\Gamma_{\text{total}}$	l					Γ <sub>16</sub> /Γ
VALUE		DOCUMENT ID		TECN	COMMENT	
not seen		PAKHLOVA	11	BELL	$e^+e^- \rightarrow$	$D_{s}^{*+}D_{s}^{*-}\gamma$
not seen		DEL-AMO-SA	10N	BABR	$e^+e^- \rightarrow$	$D_s^{*+}D_s^{*-}\gamma$
$\Gamma(\psi(3823)\pi^+\pi^-)$	/Γ <sub>total</sub>					Γ <sub>17</sub> /Γ
<u>VALUE</u>	<b>EVTS</b>	DOCUMENT ID		TECN	COMMENT	
possibly seen	19	<sup>20</sup> ABLIKIM	<b>15</b> S	BES3	$e^+e^-  ightarrow 0$	$\pi^+\pi^-\chi_{c1}\gamma$
$^{20}$ From a fit of $e^+e^-$	$^- \rightarrow \pi^+$	$\pi^- \psi$ (3823), $\psi$ (382	23) →	$\chi_{c1}\gamma$	cross section	s taken at $\sqrt{s}$

values of 4.23, 4.26, 4.36, 4.42, and 4.60 GeV to the  $\psi(4415)$  line shape.

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