

**$D_{s0}^*(2317)^\pm$**

$I(J^P) = 0(0^+)^\pm$   
 $J, P$  need confirmation.

AUBERT 06P does not observe neutral and doubly charged partners of the  $D_{s0}^*(2317)^\pm$ .

### $D_{s0}^*(2317)^\pm$ MASS

The fit includes  $D^\pm, D^0, D_s^\pm, D^{*\pm}, D^{*0}, D_s^{*\pm}, D_1(2420)^0, D_2^*(2460)^0$ , and  $D_{s1}(2536)^\pm$  mass and mass difference measurements.

| VALUE (MeV)   | EVTS                                | DOCUMENT ID           | TECN     | COMMENT  |
|---|-------------------------------------|-----------------------|----------|--|
| <b>2317.8±0.6 OUR FIT</b>   | Error includes scale factor of 1.1. |                       |          |  |
| <b>2318.0±1.0 OUR AVERAGE</b>   | Error includes scale factor of 1.4. |                       |          |  |
| 2319.6±0.2±1.4  | 3180                                | AUBERT                | 06P BABR | 10.6 $e^+e^- \rightarrow D_s^+ \pi^0 X$            |
| 2317.3±0.4±0.8  | 1022                                | <sup>1</sup> AUBERT   | 04E BABR | 10.6 $e^+e^-$                                      |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                                     |                       |          |  |
| 2317.2±1.3  | 88                                  | <sup>2</sup> AUBERT,B | 04S BABR | $B \rightarrow D_{s0}^{(*)}(2317)^+ \bar{D}^{(*)}$ |
| 2317.2±0.5±0.9  | 761                                 | <sup>3</sup> MIKAMI   | 04 BELL  | 10.6 $e^+e^-$                                      |
| 2316.8±0.4±3.0  | 1267 ± 53                           | <sup>3,4</sup> AUBERT | 03G BABR | 10.6 $e^+e^-$                                      |
| 2317.6±1.3  | 273 ± 33                            | <sup>3,5</sup> AUBERT | 03G BABR | 10.6 $e^+e^-$                                      |
| 2319.8±2.1±2.0  | 24                                  | <sup>3</sup> KROKOVNY | 03B BELL | 10.6 $e^+e^-$                                      |

<sup>1</sup> Supersedes AUBERT 03G.

<sup>2</sup> Systematic errors not evaluated.

<sup>3</sup> Not independent of the corresponding  $m_{D_{s0}^*(2317)} - m_{D_s}$ .

<sup>4</sup> From  $D_s^+ \rightarrow K^+ K^- \pi^+$  decay.

<sup>5</sup> From  $D_s^+ \rightarrow K^+ K^- \pi^+ \pi^0$  decay.

### $m_{D_{s0}^*(2317)^\pm} - m_{D_s^\pm}$

The fit includes  $D^\pm, D^0, D_s^\pm, D^{*\pm}, D^{*0}, D_s^{*\pm}, D_1(2420)^0, D_2^*(2460)^0$ , and  $D_{s1}(2536)^\pm$  mass and mass difference measurements.

| VALUE (MeV)   | EVTS                                | DOCUMENT ID            | TECN     | COMMENT       |
|---|-------------------------------------|------------------------|----------|---------------|
| <b>349.3±0.6 OUR FIT</b>  | Error includes scale factor of 1.1. |                        |          |               |
| <b>349.2±0.7 OUR AVERAGE</b>  |                                     |                        |          |               |
| 348.7±0.5±0.7   | 761                                 | MIKAMI                 | 04 BELL  | 10.6 $e^+e^-$ |
| 350.0±1.2±1.0   | 135                                 | BESSION                | 03 CLE2  | 10.6 $e^+e^-$ |
| 351.3±2.1±1.9   | 24                                  | <sup>6</sup> KROKOVNY  | 03B BELL | 10.6 $e^+e^-$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                                     |                        |          |               |
| 349.6±0.4±3.0   | 1267                                | <sup>7,8</sup> AUBERT  | 03G BABR | 10.6 $e^+e^-$ |
| 350.2±1.3   | 273                                 | <sup>9,10</sup> AUBERT | 03G BABR | 10.6 $e^+e^-$ |

<sup>6</sup> Recalculated by us using  $m_{D_s^+} = 1968.5 \pm 0.6$  MeV.

<sup>7</sup> From  $D_s^+ \rightarrow K^+ K^- \pi^+$  decay.

<sup>8</sup> Recalculated by us using  $m_{D_s^+} = 1967.20 \pm 0.03$  MeV.

<sup>9</sup> From  $D_s^+ \rightarrow K^+ K^- \pi^+ \pi^0$  decay.

<sup>10</sup> Recalculated by us using  $m_{D_s^+} = 1967.4 \pm 0.2$  MeV. Systematic errors not estimated.

### $D_{s0}^*(2317)^\pm$ WIDTH

| VALUE (MeV)   | CL% | EVTS | DOCUMENT ID | TECN     | COMMENT                                  |
|---|-----|------|-------------|----------|--|
| < <b>3.8</b>  | 95  | 3180 | AUBERT      | 06P BABR | $10.6 e^+ e^- \rightarrow D_s^+ \pi^0 X$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |     |      |             |          |  |
| < 4.6   | 90  | 761  | MIKAMI      | 04 BELL  | $10.6 e^+ e^-$                           |
| < 10  |     |      | AUBERT      | 03G BABR | $10.6 e^+ e^-$                           |
| < 7   | 90  | 135  | BESSION     | 03 CLE2  | $10.6 e^+ e^-$                           |

### $D_{s0}^*(2317)^\pm$ DECAY MODES

$D_{s0}^*(2317)^-$  modes are charge conjugates of modes below.

| Mode                              | Fraction ( $\Gamma_i/\Gamma$ ) |
|-----------------------------------|--------------------------------|
| $\Gamma_1$ $D_s^+ \pi^0$          | seen                           |
| $\Gamma_2$ $D_s^+ \gamma$         |                                |
| $\Gamma_3$ $D_s^*(2112)^+ \gamma$ |                                |
| $\Gamma_4$ $D_s^+ \gamma \gamma$  |                                |
| $\Gamma_5$ $D_s^*(2112)^+ \pi^0$  |                                |
| $\Gamma_6$ $D_s^+ \pi^+ \pi^-$    |                                |
| $\Gamma_7$ $D_s^+ \pi^0 \pi^0$    | not seen                       |

### $D_{s0}^*(2317)^\pm$ BRANCHING RATIOS

| $\Gamma(D_s^+ \pi^0)/\Gamma_{\text{total}}$ | $\Gamma_1/\Gamma$ |             |          |                |
|---|-------------------|-------------|----------|----------------|
| VALUE                                       | EVTS              | DOCUMENT ID | TECN     | COMMENT        |
| <b>seen</b>                                 | $1540 \pm 62$     | AUBERT      | 03G BABR | $10.6 e^+ e^-$ |

| $\Gamma(D_s^+ \gamma)/\Gamma(D_s^+ \pi^0)$                                    | $\Gamma_2/\Gamma_1$ |             |          |                |
|---|---------------------|-------------|----------|----------------|
| VALUE   | CL%                 | DOCUMENT ID | TECN     | COMMENT        |
| < <b>0.05</b>   | 90                  | MIKAMI      | 04 BELL  | $10.6 e^+ e^-$ |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |                     |             |          |                |
| < 0.14  | 95                  | AUBERT      | 06P BABR | $10.6 e^+ e^-$ |
| < 0.052   | 90                  | BESSION     | 03 CLE2  | $10.6 e^+ e^-$ |

$\Gamma(D_s^*(2112)^+\gamma)/\Gamma(D_s^+\pi^0)$   $\Gamma_3/\Gamma_1$

| <u>VALUE</u>  | <u>CL%</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                          |
|---|------------|--------------------|-------------|---|
| <b>&lt;0.059</b>  | 90         | BESSON             | 03          | CLE2 10.6 e <sup>+</sup> e <sup>-</sup> |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |            |                    |             |   |
| <0.16   | 95         | AUBERT             | 06P         | BABR 10.6 e <sup>+</sup> e <sup>-</sup> |
| <0.18   | 90         | MIKAMI             | 04          | BELL 10.6 e <sup>+</sup> e <sup>-</sup> |

$\Gamma(D_s^+\gamma\gamma)/\Gamma(D_s^+\pi^0)$   $\Gamma_4/\Gamma_1$

| <u>VALUE</u>  | <u>CL%</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                          |
|---|------------|--------------------|-------------|---|
| <b>&lt;0.18</b>   | 95         | AUBERT             | 06P         | BABR 10.6 e <sup>+</sup> e <sup>-</sup> |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |            |                    |             |   |
| not seen  |            | AUBERT             | 03G         | BABR 10.6 e <sup>+</sup> e <sup>-</sup> |

$\Gamma(D_s^*(2112)^+\pi^0)/\Gamma(D_s^+\pi^0)$   $\Gamma_5/\Gamma_1$

| <u>VALUE</u>    | <u>CL%</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                          |
|-----------------|------------|--------------------|-------------|---|
| <b>&lt;0.11</b> | 90         | BESSON             | 03          | CLE2 10.6 e <sup>+</sup> e <sup>-</sup> |

$\Gamma(D_s^+\pi^+\pi^-)/\Gamma(D_s^+\pi^0)$   $\Gamma_6/\Gamma_1$

| <u>VALUE</u>  | <u>CL%</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                          |
|---|------------|--------------------|-------------|---|
| <b>&lt;0.004</b>  | 90         | MIKAMI             | 04          | BELL 10.6 e <sup>+</sup> e <sup>-</sup> |
| ● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ● |            |                    |             |   |
| <0.005  | 95         | AUBERT             | 06P         | BABR 10.6 e <sup>+</sup> e <sup>-</sup> |
| <0.019  | 90         | BESSON             | 03          | CLE2 10.6 e <sup>+</sup> e <sup>-</sup> |

$\Gamma(D_s^+\pi^0\pi^0)/\Gamma(D_s^+\pi^0)$   $\Gamma_7/\Gamma_1$

| <u>VALUE</u>    | <u>CL%</u> | <u>DOCUMENT ID</u> | <u>TECN</u> | <u>COMMENT</u>                          |
|-----------------|------------|--------------------|-------------|---|
| <b>&lt;0.25</b> | 95         | AUBERT             | 06P         | BABR 10.6 e <sup>+</sup> e <sup>-</sup> |

**$D_{s0}^*(2317)^\pm$  REFERENCES**

|          |     |               |                           |                 |
|----------|-----|---------------|---------------------------|-----------------|
| AUBERT   | 06P | PR D74 032007 | B. Aubert <i>et al.</i>   | (BABAR Collab.) |
| AUBERT   | 04E | PR D69 031101 | B. Aubert <i>et al.</i>   | (BABAR Collab.) |
| AUBERT,B | 04S | PRL 93 181801 | B. Aubert <i>et al.</i>   | (BABAR Collab.) |
| MIKAMI   | 04  | PRL 92 012002 | Y. Mikami <i>et al.</i>   | (BELLE Collab.) |
| AUBERT   | 03G | PRL 90 242001 | B. Aubert <i>et al.</i>   | (BaBar Collab.) |
| BESSON   | 03  | PR D68 032002 | D. Besson <i>et al.</i>   | (CLEO Collab.)  |
| KROKOVNY | 03B | PRL 91 262002 | P. Krokovny <i>et al.</i> | (BELLE Collab.) |