

**$D^*(2007)^0$** 

$$I(J^P) = \frac{1}{2}(1^-)$$

$I, J, P$  need confirmation.

$J$  consistent with 1, value 0 ruled out (NGUYEN 77).

 **$D^*(2007)^0$  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)	DOCUMENT ID	TECN	COMMENT
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**2006.96 ± 0.10 OUR FIT**

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

2006 ± 1.5	<sup>1</sup> GOLDHABER 77	MRK1	$e^+ e^-$
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<sup>1</sup> From simultaneous fit to  $D^*(2010)^+, D^*(2007)^0, D^+$ , and  $D^0$ .

 **$m_{D^*(2007)^0} - m_{D^0}$** 

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
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**142.12 ± 0.07 OUR FIT****142.12 ± 0.07 OUR AVERAGE**

142.2 ± 0.3 ± 0.2	145	ALBRECHT 95F	ARG	$e^+ e^- \rightarrow$ hadrons
142.12 ± 0.05 ± 0.05	1176	BORTOLETTO92B	CLE2	$e^+ e^- \rightarrow$ hadrons

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142.2 ± 2.0		SADROZINSKI 80	CBAL	$D^{*0} \rightarrow D^0 \pi^0$
142.7 ± 1.7		<sup>2</sup> GOLDHABER 77	MRK1	$e^+ e^-$

<sup>2</sup> From simultaneous fit to  $D^*(2010)^+, D^*(2007)^0, D^+$ , and  $D^0$ .

 **$D^*(2007)^0$  WIDTH**

VALUE (MeV)	CL%	DOCUMENT ID	TECN	COMMENT
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<b>&lt;2.1</b>	90	<sup>3</sup> ABACHI 88B	HRS	$D^{*0} \rightarrow D^+ \pi^-$
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<sup>3</sup> Assuming  $m_{D^{*0}} = 2007.2 \pm 2.1$  MeV/ $c^2$ .

 **$D^*(2007)^0$  DECAY MODES**

$\bar{D}^*(2007)^0$  modes are charge conjugates of modes below.

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1 \quad D^0 \pi^0$	(61.9 ± 2.9) %
$\Gamma_2 \quad D^0 \gamma$	(38.1 ± 2.9) %

## CONSTRAINED FIT INFORMATION

An overall fit to a branching ratio uses 3 measurements and one constraint to determine 2 parameters. The overall fit has a  $\chi^2 = 0.5$  for 2 degrees of freedom.

The following *off-diagonal* array elements are the correlation coefficients  $\langle \delta x_i \delta x_j \rangle / (\delta x_i \delta x_j)$ , in percent, from the fit to the branching fractions,  $x_i \equiv \Gamma_i / \Gamma_{\text{total}}$ . The fit constrains the  $x_i$  whose labels appear in this array to sum to one.

$$x_2 \begin{vmatrix} & -100 \\ & \\ x_1 & \end{vmatrix}$$

### $D^*(2007)^0$ BRANCHING RATIOS

$\Gamma(D^0 \pi^0) / \Gamma(D^0 \gamma)$				$\Gamma_1 / \Gamma_2$
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
<b>1.74 ± 0.02 ± 0.13</b>	AUBERT, BE	05G	BABR 10.6 $e^+ e^- \rightarrow$ hadrons	

$\Gamma(D^0 \pi^0) / \Gamma_{\text{total}}$				$\Gamma_1 / \Gamma$
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.619 ± 0.029 OUR FIT</b>				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.635 ± 0.003 ± 0.017	69k	<sup>4</sup> AUBERT, BE	05G BABR	10.6 $e^+ e^- \rightarrow$ hadrons
0.596 ± 0.035 ± 0.028	858	<sup>5</sup> ALBRECHT	95F ARG	$e^+ e^- \rightarrow$ hadrons
0.636 ± 0.023 ± 0.033	1097	<sup>5</sup> BUTLER	92 CLE2	$e^+ e^- \rightarrow$ hadrons

$\Gamma(D^0 \gamma) / \Gamma_{\text{total}}$				$\Gamma_2 / \Gamma$
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>0.381 ± 0.029 OUR FIT</b>				
<b>0.381 ± 0.029 OUR AVERAGE</b>				
0.404 ± 0.035 ± 0.028	456	<sup>5</sup> ALBRECHT	95F ARG	$e^+ e^- \rightarrow$ hadrons
0.364 ± 0.023 ± 0.033	621	<sup>5</sup> BUTLER	92 CLE2	$e^+ e^- \rightarrow$ hadrons
0.37 ± 0.08 ± 0.08		ADLER	88D MRK3	$e^+ e^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.365 ± 0.003 ± 0.017	68k	<sup>4</sup> AUBERT, BE	05G BABR	10.6 $e^+ e^- \rightarrow$ hadrons
0.47 ± 0.23		LOW	87 HRS	29 GeV $e^+ e^-$
0.53 ± 0.13		BARTEL	85G JADE	$e^+ e^-$ , hadrons
0.47 ± 0.12		COLES	82 MRK2	$e^+ e^-$
0.45 ± 0.15		GOLDHABER	77 MRK1	$e^+ e^-$

<sup>4</sup> Derived from the ratio  $\Gamma(D^0 \pi^0) / \Gamma(D^0 \gamma)$  assuming that the branching fractions of  $D^{*0} \rightarrow D^0 \pi^0$  and  $D^{*0} \rightarrow D^0 \gamma$  decays sum to 100%

<sup>5</sup> The BUTLER 92 and ALBRECHT 95F branching ratios are not independent, they have been constrained by the authors to sum to 100%.

## $D^*(2007)^0$ REFERENCES

AUBERT,BE	05G	PR D72 091101	B. Aubert <i>et al.</i>	(BABAR Collab.)
ALBRECHT	95F	ZPHY C66 63	H. Albrecht <i>et al.</i>	(ARGUS Collab.)
BORTOLETTO	92B	PRL 69 2046	D. Bortoletto <i>et al.</i>	(CLEO Collab.)
BUTLER	92	PRL 69 2041	F. Butler <i>et al.</i>	(CLEO Collab.)
ABACHI	88B	PL B212 533	S. Abachi <i>et al.</i>	(ANL, IND, MICH, PURD+)
ADLER	88D	PL B208 152	J. Adler <i>et al.</i>	(Mark III Collab.)
LOW	87	PL B183 232	E.H. Low <i>et al.</i>	(HRS Collab.)
BARTEL	85G	PL 161B 197	W. Bartel <i>et al.</i>	(JADE Collab.)
COLES	82	PR D26 2190	M.W. Coles <i>et al.</i>	(LBL, SLAC)
SADROZINSKI	80	Madison Conf. 681	H.F.W. Sadrozinski <i>et al.</i>	(PRIN, CIT+)
GOLDHABER	77	PL 69B 503	G. Goldhaber <i>et al.</i>	(Mark I Collab.)
NGUYEN	77	PRL 39 262	H.K. Nguyen <i>et al.</i>	(LBL, SLAC) J

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