

$D^*(2007)^0$

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

$I, J, P$  need confirmation.

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

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

The fit includes  $D^\pm, D^0, D_s^\pm, D^{*\pm}, D^{*0}$ , and  $D_s^{*\pm}$  mass and mass difference measurements.

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b>2006.7 ± 0.5 OUR FIT</b>	Error includes scale factor of 1.1.		
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
2006 ± 1.5	<sup>1</sup> GOLDHABER 77	MRK1	$e^+ e^-$
<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  $D^\pm, D^0, D_s^\pm, D^{*\pm}, D^{*0}$ , and  $D_s^{*\pm}$  mass and mass difference measurements.

VALUE (MeV)	EVT5	DOCUMENT ID	TECN	COMMENT
<b>142.12 ± 0.07 OUR FIT</b>				
<b>142.12 ± 0.07 OUR AVERAGE</b>				
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
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
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
<b>&lt;2.1</b>	90	<sup>3</sup> ABACHI	88B HRS	$D^{*0} \rightarrow D^+ \pi^-$
<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**

$\Gamma(D^0 \pi^0) / \Gamma_{\text{total}}$   $\Gamma_1 / \Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.619 ± 0.029 OUR FIT</b>				

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

0.596 ± 0.035 ± 0.028	858	ALBRECHT	95F ARG	$e^+ e^- \rightarrow$ hadrons
0.636 ± 0.023 ± 0.033	1097	<sup>4</sup> BUTLER	92 CLE2	$e^+ e^- \rightarrow$ hadrons

$\Gamma(D^0 \gamma) / \Gamma_{\text{total}}$   $\Gamma_2 / \Gamma$

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
<b>0.381 ± 0.029 OUR FIT</b>				
<b>0.381 ± 0.029 OUR AVERAGE</b>				

0.404 ± 0.035 ± 0.028	456	ALBRECHT	95F ARG	$e^+ e^- \rightarrow$ hadrons
0.364 ± 0.023 ± 0.033	621	<sup>4</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. • • •

0.47 ± 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> The BUTLER 92 branching ratios are not independent, they have been constrained by the authors to sum to 100%.

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

ALBRECHT	95F	ZPHY C66 63	+Ehrlichmann+	(ARGUS Collab.)
BORTOLETTO	92B	PRL 69 2046	+Brown, Dominick+	(CLEO Collab.)
BUTLER	92	PRL 69 2041	+Fu, Kalbfleish+	(CLEO Collab.)
ABACHI	88B	PL B212 533	+Akerlof+	(ANL, IND, MICH, PURD, LBL)
ADLER	88D	PL B208 152	+Becker+	(Mark III Collab.)
LOW	87	PL B183 232	+Abachi, Akerlof, Baringer+	(HRS Collab.)
BARTEL	85G	PL 161B 197	+Dietrich, Ambrus+	(JADE Collab.)
COLES	82	PR D26 2190	+Abrams, Blocker, Blondel+	(LBL, SLAC)
SADROZINSKI	80	Madison Conf. 681	+	(PRIN, CIT, HARV, SLAC, STAN)
GOLDHABER	77	PL 69B 503	+Wiss, Abrams, Alam+	(Mark I Collab.)
NGUYEN	77	PRL 39 262	+Wiss, Abrams, Alam, Boyarski+	(LBL, SLAC) J

————— **OTHER RELATED PAPERS** —————

KAMAL	92	PL B284 421	+Xu	(ALBE)
TRILLING	81	PRPL 75 57		(LBL, UCB)
GOLDHABER	76	PRL 37 255	+Pierre, Abrams, Alam+	(Mark I Collab.)

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