

$D^*(2007)^0$

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

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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2006.93±0.16 OUR FIT

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

2006 ±1.5	¹ GOLDHABER 77	MRK1	$e^+ e^-$
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¹ 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		² GOLDHABER 77	MRK1	$e^+ e^-$

² 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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<2.1	90	³ ABACHI 88B	HRS	$D^{*0} \rightarrow D^+ \pi^-$
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³ 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 (Γ_i/Γ)
$\Gamma_1 \quad D^0 \pi^0$	(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

$\Gamma(D^0 \pi^0) / \Gamma(D^0 \gamma)$				Γ_1 / Γ_2
<u>VALUE</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1.74 ± 0.02 ± 0.13	AUBERT, BE	05G	BABR 10.6 $e^+ e^- \rightarrow$ hadrons	

$\Gamma(D^0 \pi^0) / \Gamma_{\text{total}}$				Γ_1 / Γ
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.619 ± 0.029 OUR FIT				

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0.635 ± 0.003 ± 0.017	69k	⁴ AUBERT, BE	05G	BABR 10.6 $e^+ e^- \rightarrow$ hadrons
0.596 ± 0.035 ± 0.028	858	⁵ ALBRECHT	95F	ARG $e^+ e^- \rightarrow$ hadrons
0.636 ± 0.023 ± 0.033	1097	⁵ BUTLER	92	CLE2 $e^+ e^- \rightarrow$ hadrons

$\Gamma(D^0 \gamma) / \Gamma_{\text{total}}$				Γ_2 / Γ
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.381 ± 0.029 OUR FIT				
0.381 ± 0.029 OUR AVERAGE				

0.404 ± 0.035 ± 0.028	456	⁵ ALBRECHT	95F	ARG $e^+ e^- \rightarrow$ hadrons
0.364 ± 0.023 ± 0.033	621	⁵ BUTLER	92	CLE2 $e^+ e^- \rightarrow$ hadrons
0.37 ± 0.08 ± 0.08		ADLER	88D	MRK3 $e^+ e^-$

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0.365 ± 0.003 ± 0.017	68k	⁴ 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 $e^+ e^-$

⁴ 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%

⁵ 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
