$D^*(2007)^0$

$I(J^P) = \frac{1}{2}(1^-)$
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*
2006.7±0.4 OUR FIT Error includes scale factor of 1.1.				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2006 ±1.5	[1] GOLDHABER	77	MRK1	e^+e^-

[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}, and $D_s^{*\pm}$ mass and mass difference measurements.

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
142.12±0.07 OUR FIT					
142.12±0.07 OUR AVERAGE					
142.2 ±0.3 ±0.2	145	ALBRECHT	95F	ARG	$e^+e^- \to$ hadrons
142.12±0.05±0.05	1176	BORTOLETTO	92B	CLE2	$e^+e^- \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •					
142.2 ±2.0		SADROZINSKI	80	CBAL	$D^{*0} \to D^0\pi^0$
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*
<2.1	90	[3] ABACHI	88B	HRS	$D^{*0} \to D^+\pi^-$

[3] Assuming $m_{D^{*0}} = 2007.2 \pm 2.1$ MeV/c^2.

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

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

	Mode	Fraction (Γ_i/Γ)
Γ_1	$D^0\pi^0$	(61.9±2.9) %
Γ_2	$D^0\gamma$	(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 $\left\langle\delta x_i \delta x_j\right\rangle/(\delta x_i \cdot \delta x_j)$, in percent, from the fit to the branching fractions, $x_i \equiv \Gamma_i/\Gamma_{\rm total}$. The fit constrains the x_i whose labels appear in this array to sum to one.

x_2	−100
	x_1

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

$\Gamma(D^0\pi^0)/\Gamma(D^0\gamma)$ — Γ_1/Γ_2

VALUE	DOCUMENT ID		TECN	COMMENT
1.74±0.02±0.13	AUBERT,BE	05G	BABR	10.6 $e^+e^- \rightarrow$ hadrons

$\Gamma(D^0\pi^0)/\Gamma_{\rm total}$ — Γ_1/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.619±0.029 OUR FIT					
• • • We do not use the following data for averages, fits, limits, etc. • • •					
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

$\Gamma(D^0\gamma)/\Gamma_{\rm total}$ — Γ_2/Γ

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
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^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
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 *et al.*	(BABAR Collab.)
ALBRECHT	95F	ZPHY C66 63	H. Albrecht *et al.*	(ARGUS Collab.)
BORTOLETTO	92B	PRL 69 2046	D. Bortoletto *et al.*	(CLEO Collab.)
BUTLER	92	PRL 69 2041	F. Butler *et al.*	(CLEO Collab.)
ABACHI	88B	PL B212 533	S. Abachi *et al.*	(ANL, IND, MICH, PURD+)
ADLER	88D	PL B208 152	J. Adler *et al.*	(Mark III Collab.)
LOW	87	PL B183 232	E.H. Low *et al.*	(HRS Collab.)
BARTEL	85G	PL 161B 197	W. Bartel *et al.*	(JADE Collab.)
COLES	82	PR D26 2190	M.W. Coles *et al.*	(LBL, SLAC)
SADROZINSKI	80	Madison Conf. 681	H.F.W. Sadrozinski *et al.*	(PRIN, CIT+)
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