$D^*(2007)^0$

$I(J^P) = \frac{1}{2}(1^-)$
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±0.5 OUR FIT			
• • • 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±0.05±0.05	1176±50	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	$D^{*0} \to D^+\pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
<5		GOLDHABER 76B	MRK1	$e^+e^- \to D^*D^*$

[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	$D^0\pi^0$	(64±4) %
Γ_2	$D^0\gamma$	(36±4) %

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

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

VALUE	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
0.636±0.023±0.033	1097±59	[4] BUTLER 92	CLE2	$e^+e^- \to$ hadrons

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

VALUE	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
0.364±0.023±0.033	621±52	[4] BUTLER 92	CLE2	$e^+e^- \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.37 ±0.08 ±0.08		ADLER 88D	MRK3	e^+e^-
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] The BUTLER 92 branching ratios are not independent, They have been constrained by the authors to sum to 100%.

$D^*(2007)^0$ REFERENCES

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+	(LBL, SLAC)
NGUYEN	77	PRL 39 262	+Wiss, Abrams, Alam, Boyarski+	(LBL, SLAC) J
GOLDHABER	76B	SLAC Conf. 379		(LBL, SLAC)

Available as LBL-5534.

OTHER RELATED PAPERS

KAMAL	92	PL B284 421	+Xu	(ALBE)
TRILLING	81	PRPL 75 57		(LBL, UCB)
FELDMAN	77C	Banff Sum. Inst. 75		(SLAC)
GOLDHABER	76	PRL 37 255	+Pierre, Abrams, Alam+	(LBL, SLAC)

$D^*(2010)^\pm$

$I(J^P) = \frac{1}{2}(1^-)$
I, J, P need confirmation.

$D^*(2010)^\pm$ 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*	*CHG*	*COMMENT*
2010.0±0.5 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2008 ±3	[1] GOLDHABER 77	MRK1	±	e^+e^-
2008.6±1.0	[2] PERUZZI 77	MRK1	±	e^+e^-

[1] From simultaneous fit to $D^*(2010)^+$, $D^*(2007)^0$, D^+, and D^0; not independent of FELDMAN 77B mass difference below.
[2] PERUZZI 77 mass not independent of FELDMAN 77B mass difference below and PERUZZI 77 D^0 mass value.

$m_{D^*(2010)^+} - m_{D^+}$

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*
140.64±0.09 OUR FIT				
140.64±0.08±0.06	620±42	BORTOLETTO 92B	CLE2	$e^+e^- \to$ hadrons

$m_{D^*(2010)^+} - m_{D^0}$

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*
145.42±0.05 OUR FIT				
145.42±0.04 OUR AVERAGE				
145.39±0.06±0.03		BARLAG 92B	ACCM	π^- 230 GeV
145.40±0.05±0.10		ABACHI 88B	HRS	$D^{*\pm} \to D^0\pi^\pm$
145.46±0.07±0.03		ALBRECHT 85F	ARG	$D^{*\pm} \to D^0\pi^+$
145.8 ±1.5	16	AHLEN 83	HRS	$D^{*+} \to D^0\pi^+$
145.1 ±1.8	12	BAILEY 83	SPEC	$D^{*\pm} \to D^0\pi^\pm$
145.5 ±0.3	28	BAILEY 83	SPEC	$D^{*\pm} \to D^0\pi^\pm$
145.1 ±0.5	14	BAILEY 83	SPEC	$D^{*\pm} \to D^0\pi^\pm$
145.5 ±0.5	14	YELTON 82	MRK2	29 $e^+e^- \to K^-\pi^+$
145.5 ±0.3	60	FITCH 81	SPEC	π^- A
145.2 ±0.6	2	BLIETSCHAU 79	BEBC	νp
145.3 ±0.5	30	FELDMAN 77B	MRK1	$D^{*+} \to D^0\pi^+$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
145.5 ±0.2	115	[3] ALEXANDER 91B	OPAL	$D^{*\pm} \to D^0\pi^\pm$
145.30±0.06		[3] DECAMP 91J	ALEP	$D^{*\pm} \to D^0\pi^\pm$
∼ 145.5		AVERY 80	SPEC	γ A

[3] Systematic error not evaluated.

$m_{D^*(2010)^+} - m_{D^*(2007)^0}$

VALUE (MeV)	*DOCUMENT ID*	*TECN*	*COMMENT*
• • • We do not use the following data for averages, fits, limits, etc. • • •			
2.6±1.8	[4] PERUZZI 77	MRK1	e^+e^-

[4] Not independent of FELDMAN 77B mass difference above, PERUZZI 77 D^0 mass, and GOLDHABER 77 $D^*(2007)^0$ mass.