$D^*(2010)^\pm$

$I(J^P) = \frac{1}{2}(1^-)$
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
2010.1±0.5 OUR NEW UNCHECKED FIT Error includes scale factor of 1.1. [2010.0 ± 0.5 MeV OUR 2002 FIT Scale factor = 1.1]				
• • • 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±0.10 OUR FIT Error includes scale factor of 1.1.				
140.64±0.08±0.06	620	BORTOLETTO92B	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
145.421±0.010 OUR FIT Error includes scale factor of 1.1.				
145.421±0.010 OUR AVERAGE				
145.412±0.002±0.012		[3] ANASTASSOV 02	CLE2	$D^{*\pm} \to D^0\pi^\pm \to (K\pi)\pi^\pm$
145.54 ±0.08	611	ADINOLFI 99	BEAT	$D^{*\pm} \to D^0\pi^\pm$
145.45 ±0.02		[3] BREITWEG 99	ZEUS	$D^{*\pm} \to D^0\pi^\pm \to (K\pi)\pi^\pm$
145.42 ±0.05		[3] BREITWEG 99	ZEUS	$D^{*\pm} \to D^0\pi^\pm \to (K^-3\pi)\pi^\pm$
145.5 ±0.15	103	[4] ADLOFF 97B	H1	$D^{*\pm} \to D^0\pi^\pm$
145.44 ±0.08	152	[4] BREITWEG 97	ZEUS	$D^{*\pm} \to D^0\pi^\pm$, $D^0 \to K^-3\pi$
145.42 ±0.11	199	[4] BREITWEG 97	ZEUS	$D^{*\pm} \to D^0\pi^\pm$, $D^0 \to K^-\pi^+$
145.4 ±0.2	48	[4] DERRICK 95	ZEUS	$D^{*\pm} \to D^0\pi^\pm$

145.39 ±0.06 ±0.03			BARLAG	92B	ACCM	π^- 230 GeV
145.5 ±0.2	115	[4]	ALEXANDER	91B	OPAL	$D^{*\pm} \to D^0 \pi^\pm$
145.30 ±0.06		[4]	DECAMP	91J	ALEP	$D^{*\pm} \to D^0 \pi^\pm$
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	$D^{*\pm} \to D^0 \pi^+$
145.5 ±0.3	28		BAILEY	83	SPEC	$D^{*\pm} \to D^0 \pi^\pm$
145.5 ±0.3	60		FITCH	81	SPEC	$\pi^- A$
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. • • •						
145.44 ±0.09	122	[4]	BREITWEG	97B	ZEUS	$D^{*\pm} \to D^0 \pi^\pm$, $D^0 \to K^- \pi^+$
145.8 ±1.5	16		AHLEN	83	HRS	$D^{*+} \to D^0 \pi^+$
145.1 ±1.8	12		BAILEY	83	SPEC	$D^{*\pm} \to D^0 \pi^\pm$
145.1 ±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			AVERY	80	SPEC	γA
145.2 ±0.6	2		BLIETSCHAU	79	BEBC	νp

[3] Statistical errors only.
[4] 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	[5] PERUZZI	77	MRK1	$e^+ e^-$

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

$D^*(2010)^\pm$ WIDTH

VALUE (keV)	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
96± 4±22			ANASTASSOV 02		CLE2	$D^{*\pm} \to D^0 \pi^\pm \to (K\pi)\ \pi^\pm$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
<131	90	110	BARLAG	92B	ACCM	π^- 230 GeV

$D^*(2010)^\pm$ DECAY MODES

$D^*(2010)^-$ modes are charge conjugates of the modes below.

	Mode	Fraction (Γ_i/Γ)
Γ_1	$D^0 \pi^+$	(67.7±0.5) %
Γ_2	$D^+ \pi^0$	(30.7±0.5) %
Γ_3	$D^+ \gamma$	(1.6±0.4) %

CONSTRAINED FIT INFORMATION

An overall fit to 3 branching ratios uses 6 measurements and one constraint to determine 3 parameters. The overall fit has a χ^2 = 0.3 for 4 degrees of freedom.

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

x_2	−62	
x_3	−43	−44
	x_1	x_2

$D^*(2010)^+$ BRANCHING RATIOS

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

VALUE	DOCUMENT ID		TECN	COMMENT
0.677 ±0.005 OUR FIT				
0.677 ±0.006 OUR AVERAGE				
0.6759±0.0029±0.0064	[6,7,8] BARTELT	98	CLE2	e^+e^-
0.688 ±0.024 ±0.013	ALBRECHT	95F	ARG	$e^+e^- \to$ hadrons
0.681 ±0.010 ±0.013	[6] BUTLER	92	CLE2	$e^+e^- \to$ hadrons
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.57 ±0.04 ±0.04	ADLER	88D	MRK3	e^+e^-
0.44 ±0.10	COLES	82	MRK2	e^+e^-
0.6 ±0.15	[8] GOLDHABER	77	MRK1	e^+e^-

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

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.307 ±0.005 OUR FIT					
0.3073±0.0013±0.0062		[6,7,8] BARTELT	98	CLE2	e^+e^-
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.312 ±0.011 ±0.008	1404	ALBRECHT	95F	ARG	$e^+e^- \to$ hadrons
0.308 ±0.004 ±0.008	410	[6] BUTLER	92	CLE2	$e^+e^- \to$ hadrons
0.26 ±0.02 ±0.02		ADLER	88D	MRK3	e^+e^-
0.34 ±0.07		COLES	82	MRK2	e^+e^-

$\Gamma(D^+\gamma)/\Gamma_{total}$ — Γ_3/Γ

VALUE	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
0.016 ±0.004 OUR FIT						
0.016 ±0.005 OUR AVERAGE						
0.0168±0.0042±0.0029			[6,7] BARTELT	98	CLE2	e^+e^-
0.011 ±0.014 ±0.016		12	[6] BUTLER	92	CLE2	$e^+e^- \to$ hadrons

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

<0.052		90	ALBRECHT	95F	ARG	$e^+e^- \to$ hadrons
0.17	±0.05	±0.05	ADLER	88D	MRK3	e^+e^-
0.22	±0.12		[9] COLES	82	MRK2	e^+e^-

[6] The branching ratios are not independent, they have been constrained by the authors to sum to 100%.
[7] Systematic error includes theoretical error on the prediction of the ratio of hadronic modes.
[8] Assuming that isospin is conserved in the decay.
[9] Not independent of $\Gamma(D^0\pi^+)/\Gamma_{total}$ and $\Gamma(D^+\pi^0)/\Gamma_{total}$ measurement.

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