

$D_2^*(2460)^0$

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

$J^P = 2^+$ assignment strongly favored(ALBRECHT 89B, ALBRECHT 89H), natural parity confirmed by the helicity analysis(DEL-AMO-SANCHEZ 10P),

$D_2^*(2460)^0$ 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)	EVTS	DOCUMENT ID	TECN	COMMENT
2462.6±0.7 OUR FIT	Error includes scale factor of 1.3.			
2461.8±0.8 OUR AVERAGE	Error includes scale factor of 1.2.			
2462.2±0.1±0.8	243k	DEL-AMO-SA..10P	BABR	$e^+e^- \rightarrow D^+\pi^-X$
2460.4±1.2±2.2	3.4k	AUBERT	09AB BABR	$B^- \rightarrow D^+\pi^-\pi^-$
2461.6±2.1±3.3		¹ ABE	04D BELL	$B^- \rightarrow D^+\pi^-\pi^-$
2464.5±1.1±1.9	5.8k	¹ LINK	04A FOCS	γA
2465 ±3 ±3	486	AVERY	94C CLE2	$e^+e^- \rightarrow D^+\pi^-X$
2453 ±3 ±2	128	FRABETTI	94B E687	$\gamma Be \rightarrow D^+\pi^-X$
2461 ±3 ±1	440	AVERY	90 CLEO	$e^+e^- \rightarrow D^{*+}\pi^-X$
2455 ±3 ±5	337	ALBRECHT	89B ARG	$e^+e^- \rightarrow D^+\pi^-X$
2459 ±3 ±2	153	ANJOS	89C TPS	$\gamma N \rightarrow D^+\pi^-X$

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

2469.1±3.7 ^{+1.2} _{-1.3}	1560 ± 230	² CHEKANOV	09 ZEUS	$e^\pm p \rightarrow D^{(*)+}\pi^-X$
2463.3±0.6±0.8	20k	ABULENCIA	06A CDF	1900 $p\bar{p} \rightarrow D^+\pi^-X$
2461 ±6	126	³ ABREU	98M DLPH	e^+e^-
2466 ±7	1	ASRATYAN	95 BEBC	53,40 $\nu(\bar{\nu}) \rightarrow pX, dX$

¹ Fit includes the contribution from $D_0^*(2400)^0$.

² Calculated using the mass difference $m(D_2^{*0}) - m(D^{*+})_{PDG}$ reported below and $m(D^{*+})_{PDG} = 2010.27 \pm 0.17$ MeV. The 0.17 MeV uncertainty of the PDG mass value should be added to the experimental uncertainty of $^{+1.2}_{-1.3}$ MeV.

³ No systematic error given.

$m_{D_2^{*0}} - m_{D^+}$

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
593.0±0.7 OUR FIT	Error includes scale factor of 1.3.			
593.9±0.6±0.5	20k	ABULENCIA	06A CDF	1900 $p\bar{p} \rightarrow D^+\pi^-X$

$$m_{D_2^{*0}} - m_{D^{*+}}$$

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.

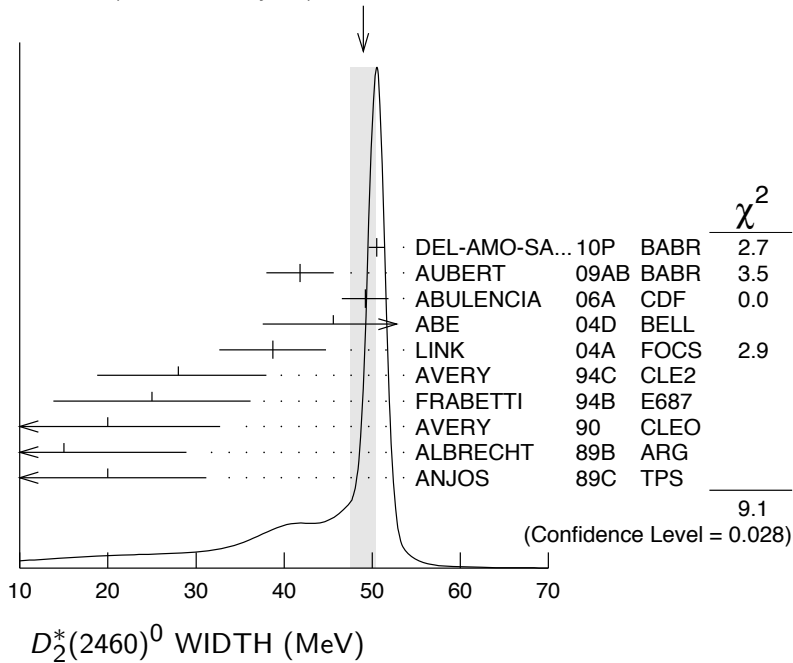
VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
452.4 ± 0.7 OUR FIT	Error includes scale factor of 1.3.			
458.8 ± 3.7^{+1.2}_{-1.3}	1560 ± 230	CHEKANOV	09	ZEUS $e^\pm p \rightarrow D^{(*)+} \pi^- X$

$D_2^*(2460)^0$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
49.0 ± 1.4 OUR AVERAGE	Error includes scale factor of 1.7. See the ideogram below.			
50.5 ± 0.6 ± 0.7	243k	DEL-AMO-SA...10P	BABR	$e^+ e^- \rightarrow D^+ \pi^- X$
41.8 ± 2.5 ± 2.9	3.4k	AUBERT	09AB BABR	$B^- \rightarrow D^+ \pi^- \pi^-$
49.2 ± 2.3 ± 1.3	20k	ABULENCIA	06A CDF	1900 $p\bar{p} \rightarrow D^+ \pi^- X$
45.6 ± 4.4 ± 6.7		⁴ ABE	04D BELL	$B^- \rightarrow D^+ \pi^- \pi^-$
38.7 ± 5.3 ± 2.9	5.8k	⁴ LINK	04A FOCS	γA
28 ⁺⁸ ₋₇ ± 6	486	AVERY	94C CLE2	$e^+ e^- \rightarrow D^+ \pi^- X$
25 ± 10 ± 5	128	FRABETTI	94B E687	$\gamma Be \rightarrow D^+ \pi^- X$
20 ⁺⁹ ₋₁₂ ⁺⁹ ₋₁₀	440	AVERY	90 CLEO	$e^+ e^- \rightarrow D^{*+} \pi^- X$
15 ⁺¹³ ₋₁₀ ⁺⁵ ₋₁₀	337	ALBRECHT	89B ARG	$e^+ e^- \rightarrow D^+ \pi^- X$
20 ± 10 ± 5	153	ANJOS	89C TPS	$\gamma N \rightarrow D^+ \pi^- X$

⁴ Fit includes the contribution from $D_0^*(2400)^0$.

WEIGHTED AVERAGE
49.0 ± 1.4 (Error scaled by 1.7)



$D_2^*(2460)^0$ DECAY MODES

$\bar{D}_2^*(2460)^0$ modes are charge conjugates of modes below.

Mode	Fraction (Γ_i/Γ)
Γ_1 $D^+ \pi^-$	seen
Γ_2 $D^*(2010)^+ \pi^-$	seen
Γ_3 $D^0 \pi^+ \pi^-$	not seen
Γ_4 $D^{*0} \pi^+ \pi^-$	not seen

$D_2^*(2460)^0$ BRANCHING RATIOS

$\Gamma(D^+ \pi^-)/\Gamma_{\text{total}}$					Γ_1/Γ
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
seen	3.4k	AUBERT	09AB BABR	$B^- \rightarrow D^+ \pi^- \pi^-$	
seen	337	ALBRECHT	89B ARG	$e^+ e^- \rightarrow D^+ \pi^- X$	
seen		ANJOS	89C TPS	$\gamma N \rightarrow D^+ \pi^- X$	

$\Gamma(D^*(2010)^+ \pi^-)/\Gamma_{\text{total}}$					Γ_2/Γ
<u>VALUE</u>		<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
seen		ACKERSTAFF	97W OPAL	$e^+ e^- \rightarrow D^{*+} \pi^- X$	
seen		AVERY	90 CLEO	$e^+ e^- \rightarrow D^{*+} \pi^- X$	
seen		ALBRECHT	89H ARG	$e^+ e^- \rightarrow D^* \pi^- X$	

$\Gamma(D^+ \pi^-)/\Gamma(D^*(2010)^+ \pi^-)$					Γ_1/Γ_2
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
1.56 ± 0.16 OUR AVERAGE					
1.47 ± 0.03 ± 0.16	379k	DEL-AMO-SA..10P	BABR	$e^+ e^- \rightarrow D^{(*)+} \pi^- X$	
2.8 ± 0.8 ^{+0.5} / _{-0.6}	1560 ± 230	CHEKANOV	09 ZEUS	$e^\pm p \rightarrow D^{(*)+} \pi^- X$	
2.2 ± 0.7 ± 0.6		AVERY	94C CLE2	$e^+ e^- \rightarrow D^{*+} \pi^- X$	
2.3 ± 0.8		AVERY	90 CLEO	$e^+ e^-$	
3.0 ± 1.1 ± 1.5		ALBRECHT	89H ARG	$e^+ e^- \rightarrow D^* \pi^- X$	
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
1.9 ± 0.5		ABE	04D BELL	$B^- \rightarrow D^{(*)+} \pi^- \pi^-$	

$\Gamma(D^+ \pi^-)/[\Gamma(D^+ \pi^-) + \Gamma(D^*(2010)^+ \pi^-)]$					$\Gamma_1/(\Gamma_1 + \Gamma_2)$
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>	
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●					
0.62 ± 0.03 ± 0.02	8414	⁵ AUBERT	09Y BABR	$B^+ \rightarrow D_2^{*0} \ell^+ \nu_\ell$	

⁵ Assuming $\Gamma(\Upsilon(4S) \rightarrow B^+ B^-) / \Gamma(\Upsilon(4S) \rightarrow B^0 \bar{B}^0) = 1.065 \pm 0.026$ and equal partial widths for charged and neutral D_2^* mesons.

$D_2^*(2460)^0$ POLARIZATION AMPLITUDE A_{D_2}

A polarization amplitude A_{D_2} is a parameter that depends on the initial polarization of the D_2 . For D_2 decays the helicity angle, θ_H , distribution varies like $1 + A_{D_2} \cos(\theta_H)$, where θ_H is the angle in the D^* rest frame between the two pions emitted by the $D_2 \rightarrow D^* \pi$ and $D^* \rightarrow D \pi$.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
consistent with -1	243k	DEL-AMO-SA..10P	BABR	$e^+ e^- \rightarrow D^+ \pi^- X$
$-0.74^{+0.49}_{-0.38}$		⁶ AVERY	94C CLE2	$e^+ e^- \rightarrow D^{*+} \pi^- X$

⁶ Systematic uncertainties not estimated.

$D_2^*(2460)^0$ REFERENCES

DEL-AMO-SA... 10P	PR D82 111101	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)
AUBERT 09AB	PR D79 112004	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT 09Y	PRL 103 051803	B. Aubert <i>et al.</i>	(BABAR Collab.)
CHEKANOV 09	EPJ C60 25	S. Chekanov <i>et al.</i>	(ZEUS Collab.)
ABULENCIA 06A	PR D73 051104	A. Abulencia <i>et al.</i>	(CDF Collab.)
ABE 04D	PR D69 112002	K. Abe <i>et al.</i>	(BELLE Collab.)
LINK 04A	PL B586 11	J.M. Link <i>et al.</i>	(FOCUS Collab.)
ABREU 98M	PL B426 231	P. Abreu <i>et al.</i>	(DELPHI Collab.)
ACKERSTAFF 97W	ZPHY C76 425	K. Ackerstaff <i>et al.</i>	(OPAL Collab.)
ASRATYAN 95	ZPHY C68 43	A.E. Asratyan <i>et al.</i>	(BIRM, BELG, CERN+)
AVERY 94C	PL B331 236	P. Avery <i>et al.</i>	(CLEO Collab.)
FRABETTI 94B	PRL 72 324	P.L. Frabetti <i>et al.</i>	(FNAL E687 Collab.)
AVERY 90	PR D41 774	P. Avery, D. Besson	(CLEO Collab.)
ALBRECHT 89B	PL B221 422	H. Albrecht <i>et al.</i>	(ARGUS Collab.) JP
ALBRECHT 89H	PL B232 398	H. Albrecht <i>et al.</i>	(ARGUS Collab.) JP
ANJOS 89C	PRL 62 1717	J.C. Anjos <i>et al.</i>	(FNAL E691 Collab.)