NODE=M119

$D_2^*(2460)^0$

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

$J^P = 2^+$ assignment strongly favored (ALBRECHT 89B, ALBRECHT 89H), natural parity confirmed by the helicity analysis (DEL-AMO-SANCHEZ 10P). AAIJ 13CC confirms $J^P = 2^+$ and natural parity.

NODE=M119

$D_2^*(2460)0$ MASS

NODE=M119M

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.

NODE=M119M

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
2460.7 ±0.4 OUR FIT Error includes scale factor of 2.9. [2460.7 ± 0.4 MeV OUR 2020 FIT Scale factor = 3.1]					NEW
2460.58±0.34 OUR AVERAGE Error includes scale factor of 2.5. See the ideogram below. [2460.56 ± 0.35 MeV OUR 2020 AVERAGE Scale factor = 2.6]					NEW
2463.7 ±0.4 ±0.7	28k	[1] AAIJ	16AH	LHCB	$B^- \to D^+\pi^-\pi^-$ OCCUR=2
2464.0 ±1.4 ±0.5	2k	[2] AAIJ	15V	LHCB	$B^- \to D^+K^-\pi^-$
2460.4 ±0.4 ±1.2	82k	AAIJ	13CC	LHCB	$pp \to D^{*+}\pi^- X$
2460.4 ±0.1 ±0.1	675k	AAIJ	13CC	LHCB	$pp \to D^+\pi^- X$ OCCUR=2
2462.5 ±2.4 $^{+1.3}_{-1.1}$	2.3k	[3] ABRAMOWICZ	13	ZEUS	$e^\pm p \to D^{(*)+}\pi^- X$
2462.2 ±0.1 ±0.8	243k	DEL-AMO-SA..	10P	BABR	$e^+e^- \to D^+\pi^- X$
2460.4 ±1.2 ±2.2	3.4k	AUBERT	09AB	BABR	$B^- \to D^+\pi^-\pi^-$
2461.6 ±2.1 ±3.3		[4] ABE	04D	BELL	$B^- \to D^+\pi^-\pi^-$
2464.5 ±1.1 ±1.9	5.8k	[4] LINK	04A	FOCS	γ A
2465 ±3 ±3	486	AVERY	94C	CLE2	$e^+e^- \to D^+\pi^-$X
2453 ±3 ±2	128	FRABETTI	94B	E687	γBe $\to D^+\pi^-$X
2461 ±3 ±1	440	AVERY	90	CLEO	$e^+e^- \to D^{*+}\pi^-$X
2455 ±3 ±5	337	ALBRECHT	89B	ARG	$e^+e^- \to D^+\pi^-$X
2459 ±3 ±2	153	ANJOS	89C	TPS	$\gamma N \to D^+\pi^-$X
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2469.1 ±3.7 $^{+1.2}_{-1.3}$	1.5k	[5] CHEKANOV	09	ZEUS	$e^\pm p \to D^{(*)+}\pi^- X$
2463.3 ±0.6 ±0.8	20k	ABULENCIA	06A	CDF	1900 $p\overline{p} \to D^+\pi^- X$
2461 ±6	126	[6] ABREU	98M	DLPH	e^+e^-
2466 ±7	1	ASRATYAN	95	BEBC	53,40 $\nu(\overline{\nu}) \to pX,dX$

[1] From the amplitude analysis in the model describing the $D^+\pi^-$ wave together with virtual contributions from the $D^*(2007)^0$ and B^{*0} states, and components corresponding to the $D_2^*(2460)^0$, $D_1^*(2680)^0$, $D_3^*(2760)^0$, and $D_2^*(3000)^0$ resonances. NODE=M119M;LINKAGE=B

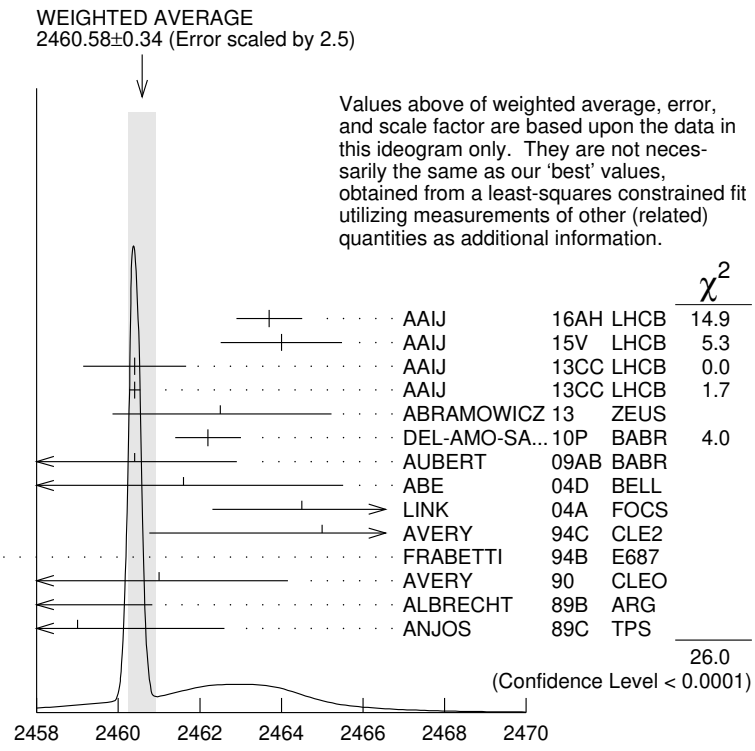
[2] From the amplitude analysis in the model describing the $D^+\pi^-$ wave together with virtual contributions from the $D^*(2007)^0$ and B^{*0} states, nonresonant spin-0 and spin-1 components as well as the $D_0^*(2400)^0$, $D_2^*(2460)^0$ and $D_1^*(2760)^0$ resonances. NODE=M119M;LINKAGE=A

[3] From the combined fit of the $M(D^+\pi^-)$ and $M(D^{*+}\pi^-)$ distributions. and A_{D_2} fixed to the theoretical prediction of -1. NODE=M119M;LINKAGE=AR

[4] Fit includes the contribution from $D_0^*(2400)^0$. NODE=M119M;LINKAGE=LI

[5] 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. NODE=M119M;LINKAGE=CH

[6] No systematic error given. NODE=M119M;LINKAGE=K



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

NODE=M119DM

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.

NODE=M119DM

NODE=M119DM

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
591.0±0.4 OUR FIT Error includes scale factor of 2.8. [591.0 ± 0.4 MeV OUR 2020 FIT Scale factor = 2.9]					NEW
593.9±0.6±0.5	20k	ABULENCIA	06A	CDF	1900 $p\overline{p} \rightarrow D^+\pi^- X$

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

NODE=M119DM2

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.

NODE=M119DM2

NODE=M119DM2

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
450.4±0.4 OUR FIT Error includes scale factor of 2.8. [450.4 ± 0.4 MeV OUR 2020 FIT Scale factor = 2.9]					NEW
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

NODE=M119W

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
47.4± 1.0 OUR AVERAGE Error includes scale factor of 1.7. See the ideogram below. [47.5 ± 1.1 MeV OUR 2020 AVERAGE Scale factor = 1.8]					NEW
47.0± 0.8± 1.0	28k	[7] AAIJ	16AH	LHCB	$B^- \rightarrow D^+\pi^-\pi^-$
43.8± 2.9± 1.8	2k	[8] AAIJ	15V	LHCB	$B^- \rightarrow D^+K^-\pi^-$
43.2± 1.2± 3.0	82k	AAIJ	13CC	LHCB	$pp \rightarrow D^{*+}\pi^- X$
45.6± 0.4± 1.1	675k	AAIJ	13CC	LHCB	$pp \rightarrow D^+\pi^- X$
46.6± 8.1$^{+\ 5.9}_{-\ 3.8}$	2.3k	[9] ABRAMOWICZ	13	ZEUS	$e^{\pm}p \rightarrow D^{(*)+}\pi^- X$
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 $p\overline{p} \rightarrow D^+\pi^- X$

OCCUR=3

OCCUR=2

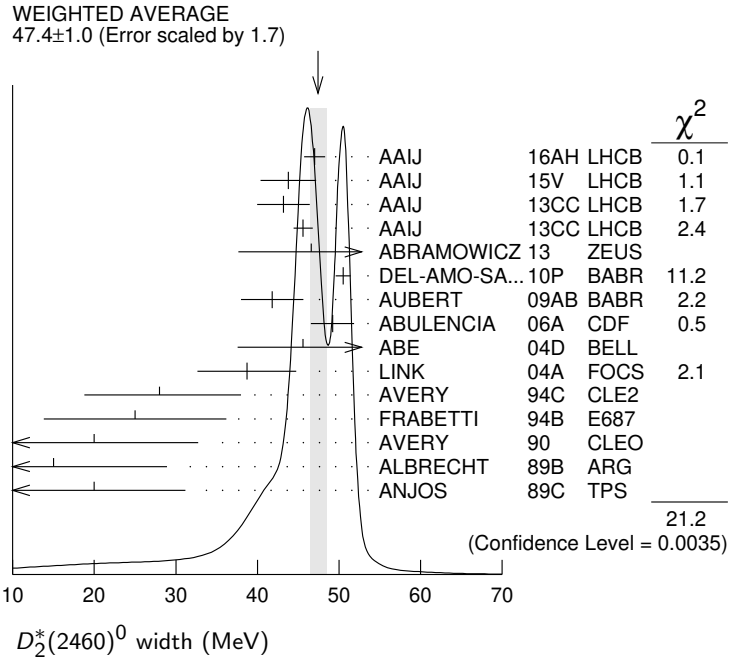
45.6± 4.4± 6.7		[10] ABE	04D	BELL	$B^- \to D^+\pi^-\pi^-$	
38.7± 5.3± 2.9	5.8k	[10] LINK	04A	FOCS	γ A	
28 $^{+\ 8}_{-\ 7}$ ± 6	486	AVERY	94C	CLE2	$e^+e^- \to D^+\pi^-$X	
25 ±10 ± 5	128	FRABETTI	94B	E687	γBe $\to D^+\pi^-$X	
20 $^{+\ 9}_{-12}$ $^{+\ 9}_{-10}$	440	AVERY	90	CLEO	$e^+e^- \to D^{*+}\pi^-$X	
15 $^{+13}_{-10}$ $^{+\ 5}_{-10}$	337	ALBRECHT	89B	ARG	$e^+e^- \to D^+\pi^-$X	
20 ±10 ± 5	153	ANJOS	89C	TPS	$\gamma N \to D^+\pi^-$X	

[7] From the amplitude analysis in the model describing the $D^+\pi^-$ wave together with virtual contributions from the $D^*(2007)^0$ and B^{*0} states, and components corresponding to the $D_2^*(2460)^0$, $D_1^*(2680)^0$, $D_3^*(2760)^0$, and $D_2^*(3000)^0$ resonances. NODE=M119W;LINKAGE=D

[8] From the amplitude analysis in the model describing the $D^+\pi^-$ wave together with virtual contributions from the $D^*(2007)^0$ and B^{*0} states, nonresonant spin-0 and spin-1 components as well as the $D_0^*(2400)^0$, $D_2^*(2460)^0$ and $D_1^*(2760)^0$ resonances. NODE=M119W;LINKAGE=A

[9] From the combined fit of the $M(D^+\pi^-)$ and $M(D^{*+}\pi^-)$ distributions. and A_{D_2} fixed to the theoretical prediction of -1. NODE=M119W;LINKAGE=AR

[10] Fit includes the contribution from $D_0^*(2400)^0$. NODE=M119W;LINKAGE=LI



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

NODE=M119215;NODE=M119

$\overline{D}_2^*(2460)^0$ modes are charge conjugates of modes below. NODE=M119

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$D^+\pi^-$	seen	CLUMP=A;DESIG=1
Γ_2	$D^*(2010)^+\pi^-$	seen	DESIG=2
Γ_3	$D^0\pi^+\pi^-$	not seen	DESIG=3;OUR EST;→ UNCHECKED ←
Γ_4	$D^{*0}\pi^+\pi^-$	not seen	DESIG=4;OUR EST;→ UNCHECKED ←

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

NODE=M119220

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

NODE=M119R1
NODE=M119R1

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
seen	3.4k	AUBERT	09AB	BABR	$B^- \to D^+\pi^-\pi^-$
seen	337	ALBRECHT	89B	ARG	$e^+e^- \to D^+\pi^-$X
seen		ANJOS	89C	TPS	$\gamma N \to D^+\pi^-$X

$\Gamma(D^*(2010)^+\pi^-)/\Gamma_{total}$ Γ_2/Γ

NODE=M119R2
NODE=M119R2

VALUE	DOCUMENT ID		TECN	COMMENT
seen	ACKERSTAFF	97W	OPAL	$e^+e^- \to D^{*+}\pi^-X$
seen	AVERY	90	CLEO	$e^+e^- \to D^{*+}\pi^-X$
seen	ALBRECHT	89H	ARG	$e^+e^- \to D^*\pi^-X$

$\Gamma(D^+\pi^-)/\Gamma(D^*(2010)^+\pi^-)$ Γ_1/Γ_2

NODE=M119R3
NODE=M119R3

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
1.54±0.15 OUR AVERAGE					
$1.4 \pm 0.3 \pm 0.3$	2.3k	[11] ABRAMOWICZ13		ZEUS	$e^\pm p \to D^{(*)+}\pi^-X$
$1.47 \pm 0.03 \pm 0.16$	379k	DEL-AMO-SA..10P		BABR	$e^+e^- \to D^{(*)+}\pi^-X$
$2.8 \pm 0.8\ ^{+0.5}_{-0.6}$	1560 ± 230	CHEKANOV	09	ZEUS	$e^\pm p \to D^{(*)+}\pi^-X$
$2.2 \pm 0.7 \pm 0.6$		AVERY	94C	CLE2	$e^+e^- \to D^{*+}\pi^-X$
2.3 ± 0.8		AVERY	90	CLEO	e^+e^-
$3.0 \pm 1.1 \pm 1.5$		ALBRECHT	89H	ARG	$e^+e^- \to D^*\pi^-X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.9 ± 0.5		ABE	04D	BELL	$B^- \to D^{(*)+}\pi^-\pi^-$

[11] From the combined fit of the $M(D^+\pi^-)$ and $M(D^{*+}\pi^-)$ distributions. and A_{D_2} fixed to the theoretical prediction of -1.

NODE=M119R3;LINKAGE=AR

$\Gamma(D^+\pi^-)/[\Gamma(D^+\pi^-)+\Gamma(D^*(2010)^+\pi^-)]$ $\Gamma_1/(\Gamma_1+\Gamma_2)$

NODE=M119R01
NODE=M119R01

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$0.62 \pm 0.03 \pm 0.02$	8414	[12] AUBERT	09Y	BABR	$B^+ \to D_2^{*0}\ell^+\nu_\ell$

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

NODE=M119R01;LINKAGE=AU

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

NODE=M119PAM

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 $1 + A_{D_2}\cos^2(\theta_H)$, where θ_H is the angle in the D^* rest frame between the two pions emitted by the $D_2 \to D^*\pi$ and $D^* \to D\pi$.

NODE=M119PAM

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •					
-1.16 ± 0.35	2.3k	[13] ABRAMOWICZ13		ZEUS	$e^\pm p \to D^{(*)+}\pi^-X$
consistent with -1	243k	DEL-AMO-SA..10P		BABR	$e^+e^- \to D^+\pi^-X$
$-0.74\ ^{+0.49}_{-0.38}$		[14] AVERY	94C	CLE2	$e^+e^- \to D^{*+}\pi^-X$

NODE=M119PAM

[13] From the combined fit of the $M(D^+\pi^-)$ and $M(D^{*+}\pi^-)$ distributions.

NODE=M119PAM;LINKAGE=AB

[14] Systematic uncertainties not estimated.

NODE=M119PAM;LINKAGE=AV

$D_2^*(2460)^0$ REFERENCES

NODE=M119

AAIJ	16AH	PR D94 072001	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	15V	PR D91 092002	R. Aaij *et al.*	(LHCb Collab.)
Also		PR D93 119901 (errat.)	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	13CC	JHEP 1309 145	R. Aaij *et al.*	(LHCb Collab.)
ABRAMOWICZ	13	NP B866 229	H. Abramowicz *et al.*	(ZEUS Collab.)
DEL-AMO-SA...	10P	PR D82 111101	P. del Amo Sanchez *et al.*	(BABAR Collab.)
AUBERT	09AB	PR D79 112004	B. Aubert *et al.*	(BABAR Collab.)
AUBERT	09Y	PRL 103 051803	B. Aubert *et al.*	(BABAR Collab.)
CHEKANOV	09	EPJ C60 25	S. Chekanov *et al.*	(ZEUS Collab.)
ABULENCIA	06A	PR D73 051104	A. Abulencia *et al.*	(CDF Collab.)
ABE	04D	PR D69 112002	K. Abe *et al.*	(BELLE Collab.)
LINK	04A	PL B586 11	J.M. Link *et al.*	(FOCUS Collab.)
ABREU	98M	PL B426 231	P. Abreu *et al.*	(DELPHI Collab.)
ACKERSTAFF	97W	ZPHY C76 425	K. Ackerstaff *et al.*	(OPAL Collab.)
ASRATYAN	95	ZPHY C68 43	A.E. Asratyan *et al.*	(BIRM, BELG, CERN+)
AVERY	94C	PL B331 236	P. Avery *et al.*	(CLEO Collab.)
FRABETTI	94B	PRL 72 324	P.L. Frabetti *et al.*	(FNAL E687 Collab.)
AVERY	90	PR D41 774	P. Avery, D. Besson	(CLEO Collab.)
ALBRECHT	89B	PL B221 422	H. Albrecht *et al.*	(ARGUS Collab.) JP
ALBRECHT	89H	PL B232 398	H. Albrecht *et al.*	(ARGUS Collab.) JP
ANJOS	89C	PRL 62 1717	J.C. Anjos *et al.*	(FNAL E691 Collab.)

NODE=M119 REFID=57518 REFID=56575 REFID=57289 REFID=55581 REFID=54743 REFID=53534 REFID=52941 REFID=52929 REFID=52733 REFID=51054 REFID=50011 REFID=49775 REFID=46315 REFID=45788 REFID=44439 REFID=44096 REFID=43687 REFID=41013 REFID=40736 REFID=41001 REFID=40737