NODE=M203

$D_3^*(2750)$

$I(J^P) = \frac{1}{2}(3^-)$

J^P determined by AAIJ 15Y from the Dalitz plot analysis of $B^0 \to \overline{D}^0 \pi^+ \pi^-$ decays. NODE=M203

$D_3^*(2750)$ MASS

NODE=M203M

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT	
2763.1± 3.2 OUR AVERAGE Error includes scale factor of 2.1. See the ideogram below. [2763.5 ± 3.4 MeV OUR 2020 AVERAGE Scale factor = 2.2]							NODE=M203M NEW
2753 ± 4 ± 6	79k	[1] AAIJ	20D	LHCB		$B^- \to D^{*+}\pi^-\pi^-$	
2775.5± 4.5± 6.5	28k	[2] AAIJ	16AH	LHCB		$B^- \to D^+\pi^-\pi^-$	
2798 ± 7 ± 7		[3] AAIJ	15Y	LHCB		$B^0 \to \overline{D}^0\pi^+\pi^-$	
2761.1± 5.1± 6.5	14k	AAIJ	13CC	LHCB	0	$pp \to D^{*+}\pi^- X$	
2760.1± 1.1± 3.7	56k	AAIJ	13CC	LHCB	0	$pp \to D^+\pi^- X$	OCCUR=2
2771.7± 1.7± 3.8	20k	AAIJ	13CC	LHCB	+	$pp \to D^0\pi^+ X$	OCCUR=3
2752.4± 1.7± 2.7	23.5k	[4] DEL-AMO-SA..	10P	BABR	0	$e^+e^- \to D^{*+}\pi^- X$	
2763.3± 2.3± 2.3	11.3k	[4] DEL-AMO-SA..	10P	BABR	0	$e^+e^- \to D^+\pi^- X$	OCCUR=2
2769.7± 3.8± 1.5	5.7k	[4,5] DEL-AMO-SA..	10P	BABR	+	$e^+e^- \to D^0\pi^+ X$	OCCUR=3
• • • We do not use the following data for averages, fits, limits, etc. • • •							
2802 ±11 ±10		[6] AAIJ	15Y	LHCB		$B^0 \to \overline{D}^0\pi^+\pi^-$	OCCUR=2

[1] From a full four-body amplitude analysis of the $B^- \to D^{*+}\pi^-\pi^-$ decay. NODE=M203M;LINKAGE=D

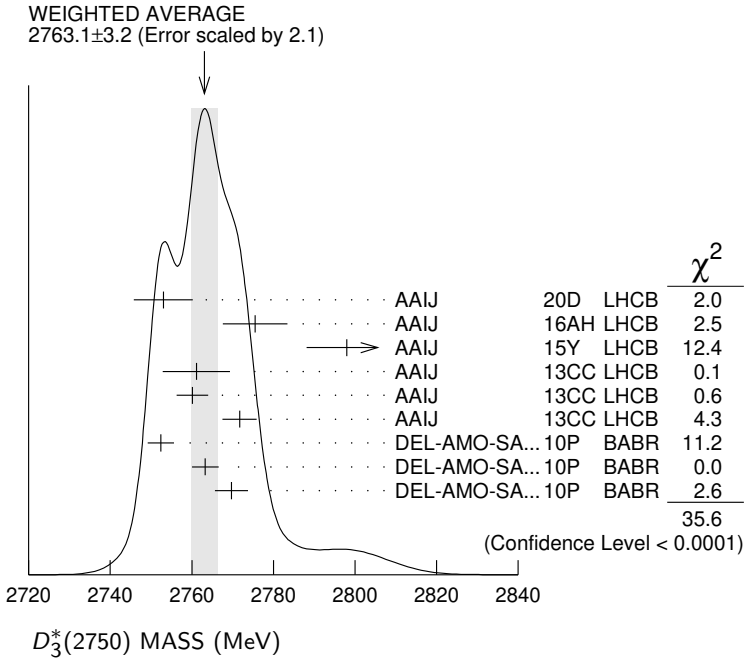
[2] From the amplitude analysis in the model describing the $D^+\pi^-$ wave together with virtual contributions from the $D^*(2007)^0$ and B^{*0} states, and components corresponding to the $D_2^*(2460)^0$, $D_1^*(2680)^0$, $D_3^*(2760)^0$, and $D_2^*(3000)^0$ resonances. NODE=M203M;LINKAGE=C

[3] Modeling the $\pi^+\pi^-$ S-wave with the Isobar formalism. NODE=M203M;LINKAGE=A

[4] The states observed in the $D^*\pi$ and $D\pi$ final states are not necessarily the same. NODE=M203M;LINKAGE=DE

[5] At a fixed width of 60.9 MeV. NODE=M203M;LINKAGE=DA

[6] Modeling the $\pi^+\pi^-$ S-wave with the K-matrix formalism. NODE=M203M;LINKAGE=B



$D_3^*(2750)$ WIDTH

NODE=M203W

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT	
66 ± 5 OUR AVERAGE							NODE=M203W
66 ±10 ±14	79k	[1] AAIJ	20D	LHCB		$B^- \to D^{*+}\pi^-\pi^-$	
95.3± 9.6±34.0	28k	[2] AAIJ	16AH	LHCB		$B^- \to D^+\pi^-\pi^-$	
105 ±18 ±24		[3] AAIJ	15Y	LHCB		$B^0 \to \overline{D}^0\pi^+\pi^-$	
74.4± 3.4±37.0	14k	AAIJ	13CC	LHCB	0	$pp \to D^{*+}\pi^- X$	
74.4± 3.4±19.1	56k	AAIJ	13CC	LHCB	0	$pp \to D^+\pi^- X$	OCCUR=2

66.7± 6.6±10.5	20k	AAIJ	13CC	LHCB +	$pp \to D^0 \pi^+ X$		OCCUR=4
71 ± 6 ±11	23.5k	[4] DEL-AMO-SA..	10P	BABR	$e^+ e^- \to D^{*+} \pi^- X$		
60.9± 5.1± 3.6	11.3k	[4] DEL-AMO-SA..	10P	BABR	$e^+ e^- \to D^+ \pi^- X$		OCCUR=2
• • • We do not use the following data for averages, fits, limits, etc. • • •							
154 ±27 ±16		[5] AAIJ	15Y	LHCB	$B^0 \to \overline{D}^0 \pi^+ \pi^-$		OCCUR=2

[1] From a full four-body amplitude analysis of the $B^- \to D^{*+} \pi^- \pi^-$ decay. NODE=M203W;LINKAGE=D

[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, and components corresponding to the $D_2^*(2460)^0$, $D_1^*(2680)^0$, $D_3^*(2760)^0$, and $D_2^*(3000)^0$ resonances. NODE=M203W;LINKAGE=C

[3] Modeling the $\pi^+ \pi^-$ S-wave with the Isobar formalism. NODE=M203W;LINKAGE=A

[4] The states observed in the $D^* \pi$ and $D \pi$ final states are not necessarily the same. NODE=M203W;LINKAGE=DE

[5] Modeling the $\pi^+ \pi^-$ S-wave with the K-matrix formalism. NODE=M203W;LINKAGE=B

$D_3^*(2750)$ DECAY MODES

NODE=M203215;NODE=M203

	Mode	Fraction (Γ_i/Γ)	
Γ_1	$D \pi$	seen	DESIG=1;OUR EVAL;→ UNCHECKED ←
Γ_2	$D^+ \pi^-$	seen	DESIG=2;OUR EVAL;→ UNCHECKED ←
Γ_3	$D^0 \pi^\pm$	seen	DESIG=3;OUR EVAL;→ UNCHECKED ←
Γ_4	$D^* \pi$	seen	DESIG=4;OUR EVAL;→ UNCHECKED ←
Γ_5	$D^{*+} \pi^-$	seen	DESIG=5;OUR EVAL;→ UNCHECKED ←

$D_3^*(2750)$ BRANCHING RATIOS

NODE=M203220

$\Gamma(D^+ \pi^-)/\Gamma(D^{*+} \pi^-)$ — Γ_2/Γ_5

NODE=M203R01

NODE=M203R01

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.42±0.05±0.11	34.8k	[1] DEL-AMO-SA..10P	BABR	$e^+ e^- \to D^{(*)+} \pi^- X$

[1] The states observed in the $D^* \pi$ and $D \pi$ final states are not necessarily the same. NODE=M203R01;LINKAGE=DE

$D_3^*(2750)$ POLARIZATION AMPLITUDE A_D

NODE=M203PAM

A polarization amplitude A_D is a parameter that depends on the initial polarization of the $D_3^*(2750)$. For $D_3^*(2750)$ decays the helicity angle, θ_H, distribution varies like $1 + A_D \cos(\theta_H)$, where θ_H is the angle in the D^* rest frame between the two pions emitted by the $D_3^*(2750) \to D^* \pi$ and $D^* \to D \pi$. NODE=M203PAM

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
−0.33±0.28	23.5k	[1] DEL-AMO-SA..10P	BABR	$e^+ e^- \to D^{*+} \pi^- X$

NODE=M203PAM

[1] Systematic uncertainties not estimated. The states observed in the $D^* \pi$ and $D \pi$ final states are not necessarily the same. NODE=M203PAM;LINKAGE=DE

$D_3^*(2750)$ REFERENCES

NODE=M203

AAIJ	20D	PR D101 032005	R. Aaij *et al.*	(LHCb Collab.)	REFID=60253
AAIJ	16AH	PR D94 072001	R. Aaij *et al.*	(LHCb Collab.)	REFID=57518
AAIJ	15Y	PR D92 032002	R. Aaij *et al.*	(LHCb Collab.) JP	REFID=56609
AAIJ	13CC	JHEP 1309 145	R. Aaij *et al.*	(LHCb Collab.)	REFID=55581
DEL-AMO-SA...	10P	PR D82 111101	P. del Amo Sanchez *et al.*	(BABAR Collab.)	REFID=53534