$D_3^*(2750)$

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

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

$D_3^*(2750)$ MASS

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.				
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	$pp \to D^+\pi^- X$
2771.7± 1.7± 3.8	20k	AAIJ	13CC	LHCB	+	$pp \to D^0\pi^+ X$
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	$e^+e^- \to D^+\pi^- X$
2769.7± 3.8± 1.5	5.7k	[4,5] DEL-AMO-SA..	10P	BABR	+	$e^+e^- \to D^0\pi^+ X$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
2802 ±11 ±10		[6] AAIJ	15Y	LHCB		$B^0 \to \overline{D}^0\pi^+\pi^-$

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

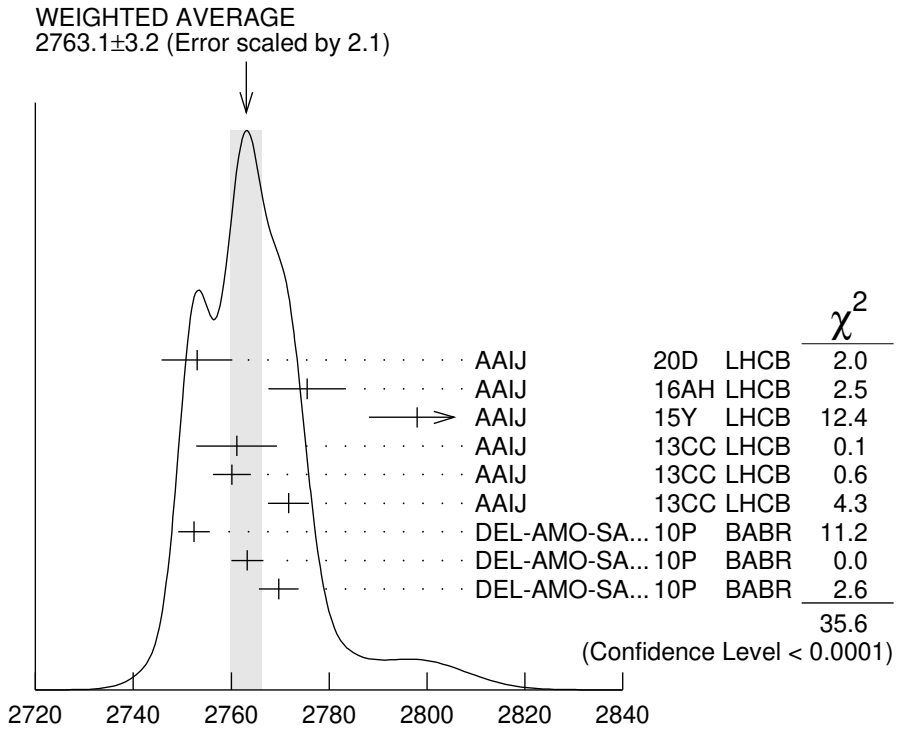
[2] From the amplitude analysis in the model describing the $D^+\pi^-$ wave together with virtual contributions from the $D^*(2007)^0$ and B^{*0} states, and components corresponding to the $D_2^*(2460)^0$, $D_1^*(2680)^0$, $D_3^*(2760)^0$, and $D_2^*(3000)^0$ resonances.

[3] Modeling the $\pi^+\pi^-$ S-wave with the Isobar formalism.

[4] The states observed in the $D^*\pi$ and $D\pi$ final states are not necessarily the same.

[5] At a fixed width of 60.9 MeV.

[6] Modeling the $\pi^+\pi^-$ S-wave with the K-matrix formalism.



$D_3^*(2750)$ WIDTH

VALUE (MeV)	*EVTS*	*DOCUMENT ID*		*TECN*	*CHG*	*COMMENT*
66 ± 5 OUR AVERAGE						
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	$pp \to D^+\pi^- X$
66.7± 6.6±10.5	20k	AAIJ	13CC	LHCB	+	$pp \to D^0\pi^+ X$
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		$e^+e^- \to D^+\pi^- X$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
154 ±27 ±16		[5] AAIJ	15Y	LHCB		$B^0 \to \overline{D}^0\pi^+\pi^-$

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

[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.

[3] Modeling the $\pi^+\pi^-$ S-wave with the Isobar formalism.

[4] The states observed in the $D^*\pi$ and $D\pi$ final states are not necessarily the same.

[5] Modeling the $\pi^+\pi^-$ S-wave with the K-matrix formalism.

$D_3^*(2750)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$D\pi$	seen
Γ_2	$D^+\pi^-$	seen
Γ_3	$D^0\pi^\pm$	seen
Γ_4	$D^*\pi$	seen
Γ_5	$D^{*+}\pi^-$	seen

$D_3^*(2750)$ BRANCHING RATIOS

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

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.

$D_3^*(2750)$ POLARIZATION AMPLITUDE A_D

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 $D^* \to D\pi$.

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	$e^+e^- \to D^{*+}\pi^- X$

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

$D_3^*(2750)$ REFERENCES

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