

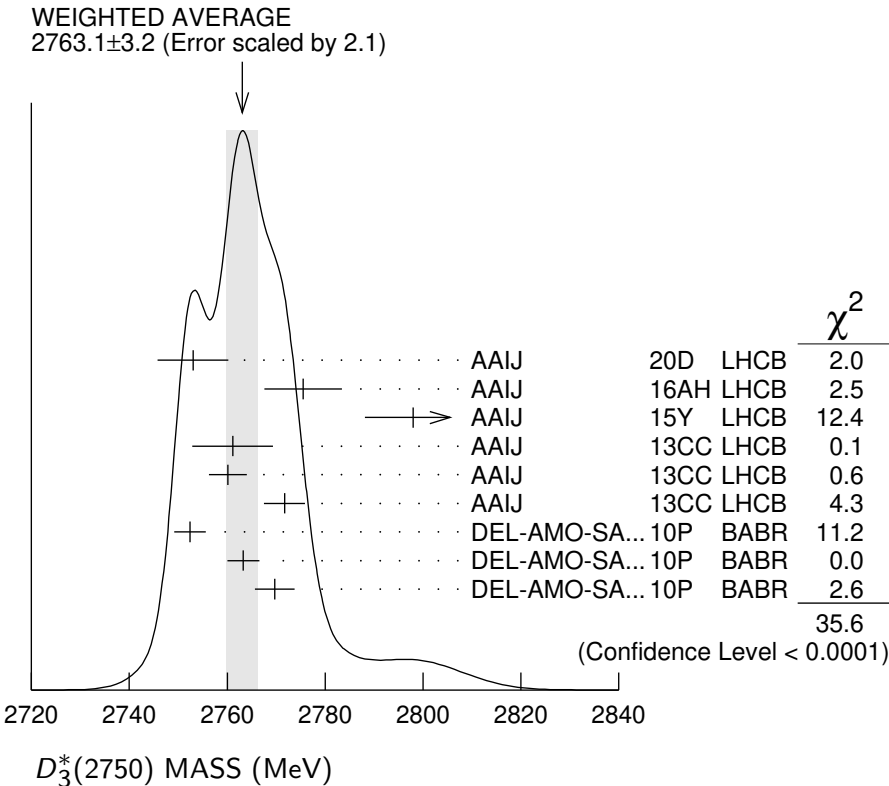
$D_3^*(2750)$

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

J^P determined by AAIJ 15Y from the Dalitz plot analysis of $B^0 \rightarrow \overline{D}^0 \pi^+ \pi^-$ 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	$B^- \rightarrow D^{*+} \pi^- \pi^-$
2775.5± 4.5± 6.5	28k	² AAIJ	16AH	LHCB	$B^- \rightarrow D^+ \pi^- \pi^-$
2798 ± 7 ± 7		³ AAIJ	15Y	LHCB	$B^0 \rightarrow \overline{D}^0 \pi^+ \pi^-$
2761.1± 5.1± 6.5	14k	AAIJ	13CC	LHCB 0	$pp \rightarrow D^{*+} \pi^- X$
2760.1± 1.1± 3.7	56k	AAIJ	13CC	LHCB 0	$pp \rightarrow D^+ \pi^- X$
2771.7± 1.7± 3.8	20k	AAIJ	13CC	LHCB +	$pp \rightarrow D^0 \pi^+ X$
2752.4± 1.7± 2.7	23.5k	⁴ DEL-AMO-SA..10P	BABR	0	$e^+ e^- \rightarrow D^{*+} \pi^- X$
2763.3± 2.3± 2.3	11.3k	⁴ DEL-AMO-SA..10P	BABR	0	$e^+ e^- \rightarrow D^+ \pi^- X$
2769.7± 3.8± 1.5	5.7k	^{4,5} DEL-AMO-SA..10P	BABR	+	$e^+ e^- \rightarrow D^0 \pi^+ X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2802 ±11 ±10		⁶ AAIJ	15Y	LHCB	$B^0 \rightarrow \overline{D}^0 \pi^+ \pi^-$



¹ From a full four-body amplitude analysis of the $B^- \rightarrow D^{*+} \pi^- \pi^-$ 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		$B^- \rightarrow D^{*+}\pi^-\pi^-$
95.3± 9.6±34.0	28k	² AAIJ	16AH LHCb		$B^- \rightarrow D^+\pi^-\pi^-$
105 ±18 ±24		³ AAIJ	15Y LHCb		$B^0 \rightarrow \bar{D}^0\pi^+\pi^-$
74.4± 3.4±37.0	14k	AAIJ	13CC LHCb	0	$pp \rightarrow D^{*+}\pi^-X$
74.4± 3.4±19.1	56k	AAIJ	13CC LHCb	0	$pp \rightarrow D^+\pi^-X$
66.7± 6.6±10.5	20k	AAIJ	13CC LHCb	+	$pp \rightarrow D^0\pi^+X$
71 ± 6 ±11	23.5k	⁴ DEL-AMO-SA..10P	BABR		$e^+e^- \rightarrow D^{*+}\pi^-X$
60.9± 5.1± 3.6	11.3k	⁴ DEL-AMO-SA..10P	BABR		$e^+e^- \rightarrow D^+\pi^-X$

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

154 ±27 ±16		⁵ AAIJ	15Y LHCb		$B^0 \rightarrow \bar{D}^0\pi^+\pi^-$
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¹ From a full four-body amplitude analysis of the $B^- \rightarrow D^{*+}\pi^-\pi^-$ 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
<u>VALUE</u>	<u>EVTS</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
0.42±0.05±0.11	34.8k	¹ DEL-AMO-SA...10P	BABR	$e^+e^- \rightarrow D^{(*)+}\pi^-X$

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 $D_3^*(2750) \rightarrow D^* \pi$ and $D^* \rightarrow D \pi$.

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
-0.33 ± 0.28	23.5k	¹ DEL-AMO-SA...10P	BABR	$e^+ e^- \rightarrow D^{*+} \pi^- X$
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 <i>et al.</i>	(LHCb Collab.)
AAIJ	16AH	PR D94 072001	R. Aaij <i>et al.</i>	(LHCb Collab.)
AAIJ	15Y	PR D92 032002	R. Aaij <i>et al.</i>	(LHCb Collab.) JP
AAIJ	13CC	JHEP 1309 145	R. Aaij <i>et al.</i>	(LHCb Collab.)
DEL-AMO-SA...	10P	PR D82 111101	P. del Amo Sanchez <i>et al.</i>	(BABAR Collab.)