

$D_0^*(2300)$

$$I(J^P) = \frac{1}{2}(0^+)$$

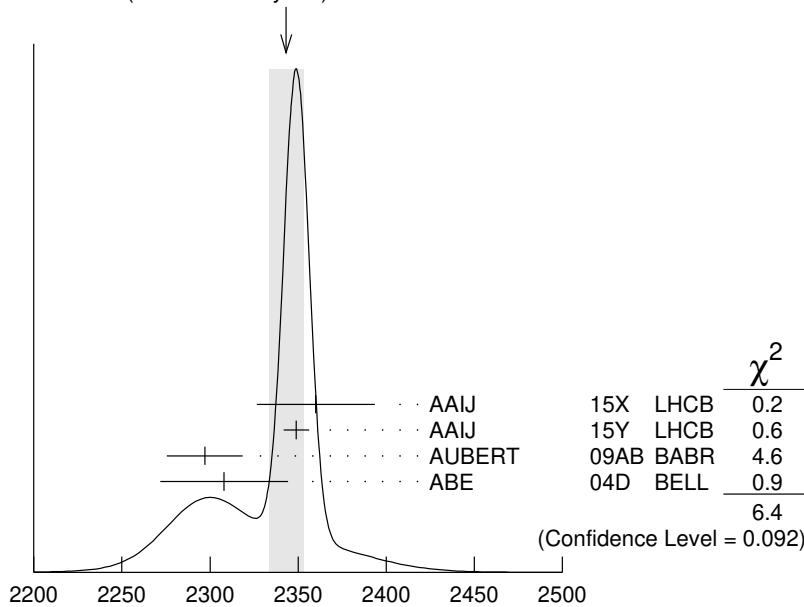
was $D_0^*(2400)$

There is a strong evidence that recent data on $B \rightarrow D\pi\pi$ (AAIJ 15Y, AAIJ 16AH) and $B \rightarrow D\pi K$ (AAIJ 14BH, AAIJ 15V, AAIJ 15X) call for two poles in the scalar $I = 1/2 \pi D$ amplitude in this mass range. The data are consistent with a lower pole at $(2105^{+6}_{-8}) - i(102^{+10}_{-11})$ MeV and a higher pole at $(2451^{+35}_{-26}) - i(134^{+7}_{-8})$ MeV (DU 18A, DU 19, DU 21). For details see review on "Heavy Non- $q\bar{q}$ Mesons."

$D_0^*(2300)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
2343 ± 10 OUR AVERAGE		Error includes scale factor of 1.5.			See the ideogram below.
2360 ± 15 ± 30		1 AAIJ	15X LHCB	+	$B^0 \rightarrow \bar{D}^0 K^+ \pi^-$
2349 ± 6 ± 4		2 AAIJ	15Y LHCB	+	$B^0 \rightarrow \bar{D}^0 \pi^+ \pi^-$
2297 ± 8 ± 20	3.4k	AUBERT	09AB BABR	0	$B^- \rightarrow D^+ \pi^- \pi^-$
2308 ± 17 ± 32		ABE	04D BELL	0	$B^- \rightarrow D^+ \pi^- \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2354 ± 7 ± 11		3 AAIJ	15Y LHCB	+	$B^0 \rightarrow \bar{D}^0 \pi^+ \pi^-$
2403 ± 14 ± 35	18.8k	4 LINK	04A FOCS	+	γA
2407 ± 21 ± 35	9.8k	4 LINK	04A FOCS	0	γA

WEIGHTED AVERAGE
2343 ± 10 (Error scaled by 1.5)



$D_0^*(2300)$ MASS (MeV)

¹ From the Dalitz plot analysis including various K^* and D^{**} mesons as well as broad structures in the $K\pi$ S-wave and the $D\pi$ S- and P-waves.

² Modeling the $\pi^+\pi^-$ S-wave with the Isobar formalism.

³ Modeling the $\pi^+\pi^-$ S-wave with the K-matrix formalism.

⁴ Possibly the feed-down from another state.

$D_0^*(2300)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
229 ± 16 OUR AVERAGE					
255 ± 26 ± 51		¹ AAIJ	15X LHCb	+	$B^0 \rightarrow \bar{D}^0 K^+ \pi^-$
217 ± 13 ± 13		² AAIJ	15Y LHCb	+	$B^0 \rightarrow \bar{D}^0 \pi^+ \pi^-$
273 ± 12 ± 48	3.4k	AUBERT	09AB BABR	0	$B^- \rightarrow D^+ \pi^- \pi^-$
276 ± 21 ± 63		ABE	04D BELL	0	$B^- \rightarrow D^+ \pi^- \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
230 ± 15 ± 21		³ AAIJ	15Y LHCb	+	$B^0 \rightarrow \bar{D}^0 \pi^+ \pi^-$
283 ± 24 ± 34	18.8k	⁴ LINK	04A FOCS	+	γA
240 ± 55 ± 59	9.8k	⁴ LINK	04A FOCS	0	γA

¹ From the Dalitz plot analysis including various K^* and D^{**} mesons as well as broad structures in the $K\pi$ S-wave and the $D\pi$ S- and P-waves.

² Modeling the $\pi^+\pi^-$ S-wave with the Isobar formalism.

³ Modeling the $\pi^+\pi^-$ S-wave with the K-matrix formalism.

⁴ Possibly the feed-down from another state.

$D_0^*(2300)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
Γ_1 $D\pi^\pm$	seen

$\Gamma(D\pi^\pm)/\Gamma_{\text{total}}$					Γ_1/Γ
VALUE	EVTS	DOCUMENT ID	TECN	CHG	COMMENT
seen		AAIJ	15X LHCb	+	$D^*(2300)^+ \rightarrow D^0 \pi^+$
seen		AAIJ	15Y LHCb	+	$D^*(2300)^+ \rightarrow D^0 \pi^+$
seen	3.4k	AUBERT	09AB BABR	0	$D^*(2300)^0 \rightarrow D^+ \pi^-$
seen		ABE	04D BELL	0	$D^*(2300)^0 \rightarrow D^+ \pi^-$
seen	18.8k	LINK	04A FOCS	+	$D^*(2300)^+ \rightarrow D^0 \pi^+$

$D_0^*(2300)$ REFERENCES

DU	21	PRL 126 192001	M.-L. Du <i>et al.</i>
DU	19	PR D99 114002	M.-L. Du, F.-K. Guo, U.-G. Meissner
DU	18A	PR D98 094018	M.-L. Du <i>et al.</i>
AAIJ	16AH	PR D94 072001	R. Aaij <i>et al.</i> (LHCb Collab.)
AAIJ	15V	PR D91 092002	R. Aaij <i>et al.</i> (LHCb Collab.)
Also		PR D93 119901 (errata.)	R. Aaij <i>et al.</i> (LHCb Collab.)
AAIJ	15X	PR D92 012012	R. Aaij <i>et al.</i> (LHCb Collab.)
AAIJ	15Y	PR D92 032002	R. Aaij <i>et al.</i> (LHCb Collab.)
AAIJ	14BH	PR D90 072003	R. Aaij <i>et al.</i> (LHCb Collab.)
AUBERT	09AB	PR D79 112004	B. Aubert <i>et al.</i> (BABAR 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.)