

$D_0^*(2300)$

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

was $D_0^*(2400)$

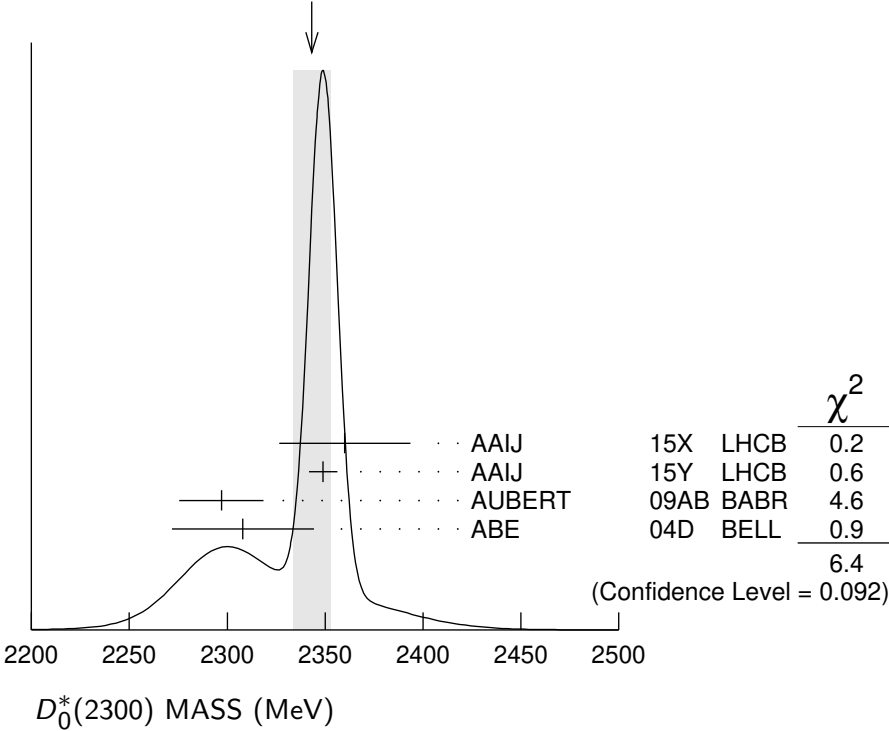
There is a strong evidence that recent data on $B \rightarrow D\pi\pi$ (AAIJ 15Y, AAIJ 16AH) and $B \rightarrow D\pi K$ (AAIJ 14BH, AAIJ 15V, AAIJ 15X) call for two poles in the scalar $I = 1/2 \pi D$ amplitude in this mass range. The data are consistent with a lower pole at $(2105^{+6}_{-8}) - i(102^{+10}_{-11})$ 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

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.

WEIGHTED AVERAGE
2343±10 (Error scaled by 1.5)



$D_0^*(2300)$ 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)
$\Gamma_1 \quad D\pi^\pm$	seen

$D_0^*(2300)$ BRANCHING RATIOS

$\Gamma(D\pi^\pm)/\Gamma_{\text{total}}$							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 (errat.)	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.)