$D_0^*(2300)$

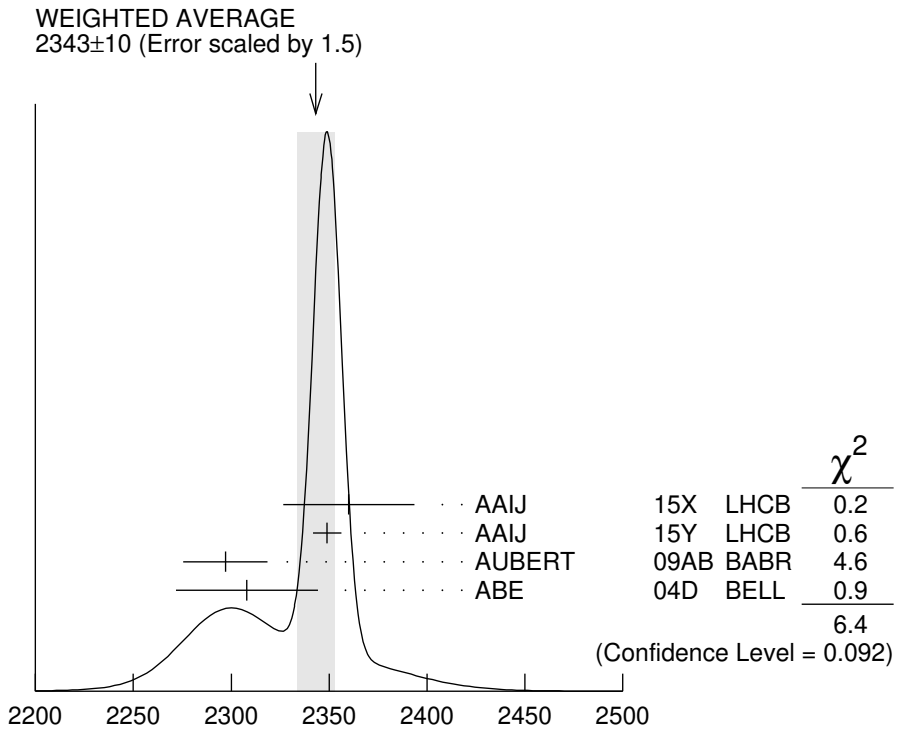
$I(J^P) = \frac{1}{2}(0^+)$

was $D_0^*(2400)$

There is a strong evidence that recent data on $B \to D\pi\pi$ (AAIJ 15Y, AAIJ 16AH) and $B \to D\pi K$ (AAIJ 14BH, AAIJ 15V, AAIJ 15X) call for two poles in the scalar $I = 1/2$ πD 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-$q\overline{q}$ 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	+	$B^0 \to \overline{D}^0 K^+ \pi^-$
2349± 6± 4		[2] AAIJ	15Y	LHCB	+	$B^0 \to \overline{D}^0 \pi^+ \pi^-$
2297± 8±20	3.4k	AUBERT	09AB	BABR	0	$B^- \to D^+ \pi^- \pi^-$
2308±17±32		ABE	04D	BELL	0	$B^- \to D^+ \pi^- \pi^-$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
2354± 7±11		[3] AAIJ	15Y	LHCB	+	$B^0 \to \overline{D}^0 \pi^+ \pi^-$
2403±14±35	18.8k	[4] LINK	04A	FOCS	+	γ A
2407±21±35	9.8k	[4] LINK	04A	FOCS	0	γ A



[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.

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

$D_0^*(2300)$ WIDTH

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

[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	+	$D^*(2300)^+ \to D^0\pi^+$
seen		AAIJ	15Y	LHCB	+	$D^*(2300)^+ \to D^0\pi^+$
seen	3.4k	AUBERT	09AB	BABR	0	$D^*(2300)^0 \to D^+\pi^-$
seen		ABE	04D	BELL	0	$D^*(2300)^0 \to D^+\pi^-$
seen	18.8k	LINK	04A	FOCS	+	$D^*(2300)^+ \to D^0\pi^+$

$D_0^*(2300)$ REFERENCES

DU	21	PRL 126 192001	M.-L. Du *et al.*	
DU	19	PR D99 114002	M.-L. Du, F.-K. Guo, U.-G. Meissner	
DU	18A	PR D98 094018	M.-L. Du *et al.*	
AAIJ	16AH	PR D94 072001	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	15V	PR D91 092002	R. Aaij *et al.*	(LHCb Collab.)
Also		PR D93 119901 (errat.)	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	15X	PR D92 012012	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	15Y	PR D92 032002	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14BH	PR D90 072003	R. Aaij *et al.*	(LHCb Collab.)
AUBERT	09AB	PR D79 112004	B. Aubert *et al.*	(BABAR Collab.)
ABE	04D	PR D69 112002	K. Abe *et al.*	(BELLE Collab.)
LINK	04A	PL B586 11	J.M. Link *et al.*	(FOCUS Collab.)