

$\Lambda_c(2880)^+$

$I(J^P) = 0(\frac{5}{2}^+)$ Status: ***

A narrow peak seen in $\Lambda_c^+ \pi^+ \pi^-$ and in $p D^0$. It is not seen in $p D^+$, and therefore it is a Λ_c^+ and not a Σ_c .

$\Lambda_c(2880)^+$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
2881.63±0.24 OUR FIT				
2881.62±0.24 OUR AVERAGE				
2881.75±0.29±0.07 ^{+0.14} _{−0.20}		¹ AAIJ	17s	LHCB in $\Lambda_b^0 \rightarrow D^0 p \pi^-$
2881.9 ±0.1 ±0.5	2.8k	AUBERT	07	BABR in $p D^0$
2881.2 ±0.2 ±0.4	690	MIZUK	07	BELL in $\Sigma_c(2455)^{0,++} \pi^\pm$

¹ The third AAIJ 17s uncertainty comes from modeling the resonant shape of the $\Lambda_c(2880)^+$ and the background (non-resonant) amplitudes.

$\Lambda_c(2880)^+ - \Lambda_c^+$ MASS DIFFERENCE

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
595.17±0.28 OUR FIT				
596 ±1 ±2	350	ARTUSO	01	CLE2 in $\Lambda_c^+ \pi^+ \pi^-$

$\Lambda_c(2880)^+$ WIDTH

VALUE (MeV)	CL%	EVTS	DOCUMENT ID	TECN	COMMENT
5.6 ^{+0.8}_{−0.6} OUR AVERAGE					
5.43 ^{+0.77+0.81} _{−0.71−0.29}		² AAIJ	17s	LHCB	in $\Lambda_b^0 \rightarrow D^0 p \pi^-$
5.8 ±1.5 ±1.1	2.8k	AUBERT	07	BABR	in $p D^0$
5.8 ±0.7 ±1.1	690	MIZUK	07	BELL	in $\Sigma_c(2455)^{0,++} \pi^\pm$

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

<8	90	ARTUSO	01	CLEO	in $\Lambda_c^+ \pi^+ \pi^-$
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² AAIJ 17s reports 5.43^{+0.77}_{−0.71} ± 0.29^{+0.75}_{−0.00} MeV value where the third uncertainty comes from modeling the resonant shape of the $\Lambda_c(2880)^+$ and the background (non-resonant) amplitudes. We have combined in quadrature the systematic uncertainties.

$\Lambda_c(2880)^+$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \quad \Lambda_c^+ \pi^+ \pi^-$	seen
$\Gamma_2 \quad \Sigma_c(2455)^{0,++} \pi^\pm$	seen
$\Gamma_3 \quad \Sigma_c(2520)^{0,++} \pi^\pm$	seen

Γ_4	$\Lambda_c^+ \eta$	
Γ_5	$p D^0$	seen

$\Lambda_c(2880)^+$ BRANCHING RATIOS

$\Gamma(\Sigma_c(2455)^{0,++} \pi^\pm) / \Gamma(\Lambda_c^+ \pi^+ \pi^-)$ Γ_2/Γ_1

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
0.392 ± 0.031 OUR AVERAGE		Error includes scale factor of 1.3.		
$0.404 \pm 0.021 \pm 0.014$		MIZUK	07	BELL in $\Sigma_c(2455)^{0,++} \pi^\pm$
$0.31 \pm 0.06 \pm 0.03$	96	ARTUSO	01	CLE2 $e^+ e^- \approx \gamma(4S)$

$\Gamma(\Sigma_c(2520)^{0,++} \pi^\pm) / \Gamma(\Lambda_c^+ \pi^+ \pi^-)$ Γ_3/Γ_1

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
$0.091 \pm 0.025 \pm 0.010$		MIZUK	07	BELL in $\Sigma_c(2455)^{0,++} \pi^\pm$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
< 0.11	90	ARTUSO	01	CLE2 $e^+ e^- \approx \gamma(4S)$

$\Gamma(\Sigma_c(2520)^{0,++} \pi^\pm) / \Gamma(\Sigma_c(2455)^{0,++} \pi^\pm)$ Γ_3/Γ_2

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
$0.225 \pm 0.062 \pm 0.025$	³ MIZUK	07	BELL in $\Sigma_c(2455)^{0,++} \pi^\pm$
³ This MIZUK 07 ratio is redundant with MIZUK 07 ratios given above.			

$\Gamma(\Lambda_c^+ \eta) / \Gamma(\Sigma_c(2455)^{0,++} \pi^\pm)$ Γ_4/Γ_2

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
< 0.13	90	LI	24C	BELL $e^+ e^-$ at $\sim \gamma(nS)$

$\Gamma(p D^0) / \Gamma(\Sigma_c(2455)^{0,++} \pi^\pm)$ Γ_5/Γ_2

VALUE	EVTS	DOCUMENT ID	TECN	COMMENT
$0.75 \pm 0.03 \pm 0.07$	12k	LI	24C	BELL $e^+ e^-$ at $\sim \gamma(nS)$

$\Lambda_c(2880)^+$ REFERENCES

LI	24C	PR D110 032021	S.X. Li <i>et al.</i>	(BELLE Collab.)
AAIJ	17S	JHEP 1705 030	R. Aaij <i>et al.</i>	(LHCb Collab.) JP
AUBERT	07	PRL 98 012001	B. Aubert <i>et al.</i>	(BABAR Collab.)
MIZUK	07	PRL 98 262001	R. Mizuk <i>et al.</i>	(BELLE Collab.)
ARTUSO	01	PRL 86 4479	M. Artuso <i>et al.</i>	(CLEO Collab.)