$\Lambda_c(2880)^+$

$I(J^P) = 0(\frac{5}{2}^+)$ 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					
$2881.75 \pm 0.29 \pm 0.07 {}^{+0.14}_{-0.20}$		[1] AAIJ	17S	LHCB	in $\Lambda_b^0 \to D^0 p \pi^-$
$2881.9 \pm 0.1 \pm 0.5$	2.8k	AUBERT	07	BABR	in $p D^0$
$2881.2 \pm 0.2 \pm 0.4$	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						
$5.43 {}^{+0.77}_{-0.71} {}^{+0.81}_{-0.29}$			[2] AAIJ	17S	LHCB	in $\Lambda_b^0 \to D^0 p \pi^-$
$5.8 \pm 1.5 \pm 1.1$		2.8k	AUBERT	07	BABR	in $p D^0$
$5.8 \pm 0.7 \pm 1.1$		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 $\Lambda_c^+ \pi^+ \pi^-$

[2] AAIJ 17S reports $5.43 {}^{+0.77}_{-0.71} \pm 0.29 {}^{+0.75}_{-0.00}$ 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)
Γ_1	$\Lambda_c^+ \pi^+ \pi^-$	seen
Γ_2	$\Sigma_c(2455)^{0,++} \pi^\pm$	seen
Γ_3	$\Sigma_c(2520)^{0,++} \pi^\pm$	seen
Γ_4	$p D^0$	seen

$\Lambda_c(2880)^+$ BRANCHING RATIOS

$\Gamma\left(\Sigma_c(2455)^{0,++}\pi^\pm\right)/\Gamma\left(\Lambda_c^+\pi^+\pi^-\right)$ 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±0.021±0.014		MIZUK 07	BELL	in $\Sigma_c(2455)^{0,++}\pi^\pm$
0.31 ±0.06 ±0.03	96	ARTUSO 01	CLE2	$e^+e^-\approx\Upsilon(4S)$

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

VALUE	CL%	DOCUMENT ID	TECN	COMMENT
0.091±0.025±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	$e^+e^-\approx\Upsilon(4S)$

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

VALUE	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •			
0.225±0.062±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.

$\Lambda_c(2880)^+$ REFERENCES

AAIJ	17S	JHEP 1705 030	R. Aaij *et al.*	(LHCb Collab.) JP
AUBERT	07	PRL 98 012001	B. Aubert *et al.*	(BABAR Collab.)
MIZUK	07	PRL 98 262001	R. Mizuk *et al.*	(BELLE Collab.)
ARTUSO	01	PRL 86 4479	M. Artuso *et al.*	(CLEO Collab.)