

$T_{c\bar{c}s1}(4220)^+$

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

OMITTED FROM SUMMARY TABLE

was  $Z_{cs}(4220)^+$

Properties incompatible with a  $q\bar{q}$  structure (exotic state). See the review on "Heavy Non- $q\bar{q}$  Mesons."

Seen by AAIJ 21E in  $B^+ \rightarrow T_{c\bar{c}s1}(4220)^+ \phi$  with  $T_{c\bar{c}s1}(4220)^+ \rightarrow J/\psi K^+$  using an amplitude analysis of  $B^+ \rightarrow J/\psi \phi K^+$  with a significance (accounting for systematic uncertainties) of  $5.9 \sigma$ . The  $J^P = 1^+$  assignment is favored over  $1^-$  with a significance of  $2 \sigma$  and other assignments are disfavored by  $4.9 \sigma$ .

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### $T_{c\bar{c}s1}(4220)^+$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>4220^{+50}_{-40}</math> OUR AVERAGE</b>		[4216 <sup>+50</sup> <sub>-40</sub> MeV OUR 2023 AVERAGE]		
<b><math>4216 \pm 24^{+43}_{-30}</math></b>	24k	<sup>1</sup> AAIJ	21E LHCB	$B^+ \rightarrow J/\psi \phi K^+$

<sup>1</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of  $5.9 \sigma$ .

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### $T_{c\bar{c}s1}(4220)^+$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
<b><math>230^{+110}_{-90}</math> OUR AVERAGE</b>		[233 <sup>+110</sup> <sub>-90</sub> MeV OUR 2023 AVERAGE]		
<b><math>233 \pm 52^{+97}_{-73}</math></b>	24k	<sup>1</sup> AAIJ	21E LHCB	$B^+ \rightarrow J/\psi \phi K^+$

<sup>1</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of  $5.9 \sigma$ .

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### $T_{c\bar{c}s1}(4220)^+$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1$ $J/\psi K^+$	seen

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$\Gamma(J/\psi K^+)/\Gamma_{\text{total}}$	EVTS	DOCUMENT ID	TECN	COMMENT	$\Gamma_1/\Gamma$
<b>seen</b>	24k	<sup>1</sup> AAIJ	21E LHCB	$B^+ \rightarrow J/\psi \phi K^+$	

<sup>1</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of  $5.9 \sigma$ .

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NODE=M260R01;LINKAGE=A

### $T_{c\bar{c}s1}(4220)^+$ REFERENCES

AAIJ 21E PRL 127 082001 R. Aaij *et al.* (LHCb Collab.) JP

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REFID=61150