

$T_{b\bar{s}}(5568)^+$

$$I(J^P) = 1(?^?)$$

OMITTED FROM SUMMARY TABLE
was $X(5568)^\pm$

Seen as a peak in the $B_s\pi^\pm$ mass spectrum with a significance of more than 3σ by ABAZOV 16E and ABAZOV 18A in inclusive $p\bar{p}$ collisions at 1.96 TeV. Not seen by AAIJ 16AI, AABOUD 18L, AALTONEN 18A, and SIRUNYAN 18J. Needs confirmation.

 $T_{b\bar{s}}(5568)^+$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
$5566.9^{+3.2+0.6}_{-3.1-1.2}$	278	¹ ABAZOV 18A	D0	$p\bar{p} \rightarrow B_s^0 \pi^\pm X$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$5567.8 \pm 2.9^{+0.9}_{-1.9}$	133	² ABAZOV 16E	D0	$p\bar{p} \rightarrow B_s^0 \pi^\pm X$
¹ From the combined analysis of $B_s^0 \rightarrow J/\psi\phi$ and $B_s^0 \rightarrow D_s^\pm \mu^\mp X$ decays.				
² Assumes $T_{b\bar{s}}(5568)^\pm \rightarrow B_s \pi^\pm$ decay. If $T_{b\bar{s}}(5568)^\pm \rightarrow B_s^* \pi^\pm$ decay is assumed, the mass shifts upward by 49 MeV.				

 $T_{b\bar{s}}(5568)^+$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
$18.6^{+7.9+3.5}_{-6.1-3.8}$	278	¹ ABAZOV 18A	D0	$p\bar{p} \rightarrow B_s \pi^\pm X$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
$21.9 \pm 6.4^{+5.0}_{-2.5}$	133	ABAZOV 16E	D0	$p\bar{p} \rightarrow B_s \pi^\pm X$
¹ From the combined analysis of $B_s^0 \rightarrow J/\psi\phi$ and $B_s^0 \rightarrow D_s^\pm \mu^\mp X$ decays.				

 $T_{b\bar{s}}(5568)^+$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 \quad B_s \pi^+$	seen

 $T_{b\bar{s}}(5568)^+$ BRANCHING RATIOS

$\Gamma(B_s \pi^+)/\Gamma_{\text{total}}$	VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	Γ_1/Γ
seen		145	¹ ABAZOV 18A	D0	$p\bar{p} \rightarrow B_s^0 \pi^\pm X$	
seen		133	² ABAZOV 16E	D0	$p\bar{p} \rightarrow B_s^0 \pi^\pm X$	
• • • We do not use the following data for averages, fits, limits, etc. • • •						
not seen			³ AABOUD 18L	ATLS	$pp \rightarrow B_s^0 \pi^\pm X$	
not seen			⁴ AALTONEN 18A	CDF	$p\bar{p} \rightarrow B_s^0 \pi^\pm X$	

not seen	⁵ SIRUNYAN	18J	CMS	$pp \rightarrow B_S^0 \pi^\pm X$
not seen	⁶ AAIJ	16AI	LHCB	$pp \rightarrow B_S^0 \pi^\pm X$

¹ With B_S mesons reconstructed in decays to $D_S^\pm \mu^\mp X$.

² Seen in $p\bar{p}$ collisions at 1.96 TeV at a rate of $(8.6 \pm 1.9 \pm 1.4)\%$ relative to inclusive B_S production in the kinematic region $10 < p_T(B_S) < 30$ GeV/c, with B_S mesons reconstructed in decays to $J/\psi\phi$. An alternative possibility, $T_{b\bar{s}}(5568)^\pm \rightarrow B_S^* \pi^\pm$ with a missing γ , could not be ruled out.

³ Not seen in 24.4 fb^{-1} of pp collision data at $\sqrt{s} = 7$ and 8 TeV with B_S mesons reconstructed in decays to $J/\psi\phi$. An upper limit on the production rate times branching fraction for $T_{b\bar{s}}(5568)^\pm \rightarrow B_S \pi^\pm$ relative to inclusive B_S production is less than 1.5% at $p_T(B_S) > 10$ GeV/c and less than 1.6% at $p_T(B_S) > 15$ GeV/c at 95% CL.

⁴ Not seen in 9.6 fb^{-1} of $p\bar{p}$ collision data at $\sqrt{s} = 1.96$ TeV with B_S mesons reconstructed in decays to $J/\psi\phi$. An upper limit on the production rate times branching fraction for $T_{b\bar{s}}(5568)^\pm \rightarrow B_S \pi^\pm$ relative to inclusive B_S production is less than 6.7% at 95% CL.

⁵ Not seen in 19.7 fb^{-1} of pp collisions data at $\sqrt{s} = 8$ TeV with B_S mesons reconstructed in decays to $J/\psi\phi$. An upper limit on the production rate times branching fraction for $T_{b\bar{s}}(5568)^\pm \rightarrow B_S \pi^\pm$ relative to inclusive B_S production is less than 1.1% at $p_T(B_S) > 10$ GeV/c and less than 1.0% at $p_T(B_S) > 15$ GeV/c at 95% CL.

⁶ Not seen in 3 fb^{-1} of pp collision data at $\sqrt{s} = 7$ and 8 TeV in a scan over the $T_{b\bar{s}}(5568)$ mass and width, with B_S mesons reconstructed in decays to $D_S^- \pi^+$ or $J/\psi\phi$. An upper limit on the production rate times branching fraction for $T_{b\bar{s}}(5568)^\pm \rightarrow B_S \pi^\pm$ relative to inclusive B_S production is less than 2.1% at $p_T(B_S) > 10$ GeV/c at 90% CL.

$T_{b\bar{s}}(5568)^+$ REFERENCES

AABOUD	18L	PRL 120 202007	M. Aaboud <i>et al.</i>	(ATLAS Collab.)
AALTONEN	18A	PRL 120 202006	T. Aaltonen <i>et al.</i>	(CDF Collab.)
ABAZOV	18A	PR D97 092004	V.M. Abazov <i>et al.</i>	(D0 Collab.)
SIRUNYAN	18J	PRL 120 202005	A.M. Sirunyan <i>et al.</i>	(CMS Collab.)
AAIJ	16AI	PRL 117 152003	R. Aaij <i>et al.</i>	(LHCb Collab.)
ABAZOV	16E	PRL 117 022003	V.M. Abazov <i>et al.</i>	(D0 Collab.)
