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

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

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

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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 $p\overline{p}$ 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	$p\overline{p} \to B_s^0\pi^\pm X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$5567.8\pm2.9^{+0.9}_{-1.9}$	133	[2] ABAZOV	16E	D0	$p\overline{p} \to B_s^0\pi^\pm X$

[1] From the combined analysis of $B_s^0 \to J/\psi\phi$ and $B_s^0 \to D_s^\pm\mu^\mp X$ decays.
[2] Assumes $T_{b\bar{s}}(5568)^\pm \to B_s\pi^\pm$ decay. If $T_{b\bar{s}}(5568)^\pm \to B_s^*\pi^\pm$ 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	$p\overline{p} \to B_s\pi^\pm X$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
$21.9\pm6.4^{+5.0}_{-2.5}$	133	ABAZOV	16E	D0	$p\overline{p} \to B_s\pi^\pm X$

[1] From the combined analysis of $B_s^0 \to J/\psi\phi$ and $B_s^0 \to D_s^\pm\mu^\mp X$ decays.

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

	Mode	Fraction (Γ_i/Γ)
Γ_1	$B_s\pi^\pm$	seen

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

$\Gamma(B_s\pi^\pm)/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
seen	145	[1] ABAZOV	18A	D0	$p\overline{p} \to B_s^0\pi^\pm X$
seen	133	[2] ABAZOV	16E	D0	$p\overline{p} \to B_s^0\pi^\pm X$

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

not seen	[3] AABOUD	18L	ATLS	$pp \to B_s^0 \pi^\pm X$
not seen	[4] AALTONEN	18A	CDF	$p\overline{p} \to B_s^0 \pi^\pm X$
not seen	[5] SIRUNYAN	18J	CMS	$pp \to B_s^0 \pi^\pm X$
not seen	[6] AAIJ	16AI	LHCB	$pp \to B_s^0 \pi^\pm X$

[1] With B_s mesons reconstructed in decays to $D_s^\pm \mu^\mp X$.

[2] Seen in $p\overline{p}$ 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, $T_{b\overline{s}}(5568)^\pm \to B_s^* \pi^\pm$ 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 $T_{b\overline{s}}(5568)^\pm \to B_s \pi^\pm$ 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 $p\overline{p}$ 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 $T_{b\overline{s}}(5568)^\pm \to B_s \pi^\pm$ 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 $T_{b\overline{s}}(5568)^\pm \to B_s \pi^\pm$ 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 $T_{b\overline{s}}(5568)$ 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 $T_{b\overline{s}}(5568)^\pm \to B_s \pi^\pm$ relative to inclusive B_s production is less than 2.1% at $p_T(B_s) > 10$ GeV/c at 90% CL.

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

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