$X(4430)^{\pm}$

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

First seen by CHOI 08 in $B \to K\pi^+\psi(2S)$ decays, confirmed by AAIJ 14AG, and confirmed in a model-independent way by AAIJ 15BH. Also seen by CHILIKIN 14 in $B \to K^+\pi J/\psi$ decays. J^P was determined by CHILIKIN 13 and AAIJ 14AG.

$X(4430)^{\pm}$ MASS

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
4478^{+15}_{-18} OUR AVERAGE				
$4475 \pm 7^{+15}_{-25}$	[1] AAIJ	14AG	LHCB	$B^0 \to K^+\pi^-\psi(2S)$
$4485 \pm 22^{+28}_{-11}$	[1] CHILIKIN	13	BELL	$B^0 \to K^+\pi^-\psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
4443^{+15+19}_{-12-13}	[2] MIZUK	09	BELL	$B \to K\pi^+\psi(2S)$
$4433 \pm 4 \pm 2$	[3] CHOI	08	BELL	$B \to K\pi^+\psi(2S)$

[1] From a four-dimensional amplitude analysis.
[2] From a Dalitz plot analysis. Superseded by CHILIKIN 13.
[3] Superseded by MIZUK 09 and CHILIKIN 13.

$X(4430)^{\pm}$ WIDTH

VALUE (MeV)	*DOCUMENT ID*		*TECN*	*COMMENT*
181 ± 31 OUR AVERAGE				
$172 \pm 13^{+37}_{-34}$	[1] AAIJ	14AG	LHCB	$B^0 \to K^+\pi^-\psi(2S)$
200^{+41+26}_{-46-35}	[1] CHILIKIN	13	BELL	$B^0 \to K^+\pi^-\psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
107^{+86+74}_{-43-56}	[2] MIZUK	09	BELL	$B \to K\pi^+\psi(2S)$
45^{+18+30}_{-13-13}	[3] CHOI	08	BELL	$B \to K\pi^+\psi(2S)$

[1] From a four-dimensional amplitude analysis.
[2] From a Dalitz plot analysis. Superseded by CHILIKIN 13.
[3] Superseded by MIZUK 09 and CHILIKIN 13.

$X(4430)^{\pm}$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)
Γ_1	$\pi^+\psi(2S)$	seen
Γ_2	$\pi^+ J/\psi$	seen

$X(4430)^{\pm}$ BRANCHING RATIOS

$\Gamma(\pi^+\psi(2S))/\Gamma_{\text{total}}$ Γ_1/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
seen	[1] AAIJ	14AG	LHCB	$B^0 \to K^+\pi^-\psi(2S)$
seen	[2] CHILIKIN	13	BELL	$B^0 \to K^+\pi^-\psi(2S)$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	[3] AUBERT	09AA	BABR	$B \to K\pi^+\psi(2S)$
seen	[4] MIZUK	09	BELL	$B \to K\pi^+\psi(2S)$

[1] From a four-dimensional amplitude analysis. No product of branching fractions quoted.

[2] From a four-dimensional amplitude analysis. Measured a product of branching fractions $\mathrm{B}(B^0 \to X(4430)^- K^+)\times\mathrm{B}(X(4430)^- \to \psi(2S)\pi^-) = (6.0^{+1.7}_{-2.0}{}^{+2.5}_{-1.4})\times 10^{-5}$.

[3] AUBERT 09AA quotes $\mathrm{B}(B^+ \to \overline{K}^0 X(4430)^+) \times \mathrm{B}(X(4430)^+ \to \pi^+\psi(2S)) < 4.7\times 10^{-5}$ and $\mathrm{B}(\overline{B}^0 \to K^- X(4430)^+) \times \mathrm{B}(X(4430)^+ \to \pi^+\psi(2S)) < 3.1\times 10^{-5}$ at 95% CL.

[4] Measured a product of branching fractions $\mathrm{B}(\overline{B}^0 \to K^- X(4430)^+) \times \mathrm{B}(X(4430)^+ \to \pi^+\psi(2S)) = (3.2^{+1.8}_{-0.9}{}^{+5.3}_{-1.6})\times 10^{-5}$. Superseded by CHILIKIN 13.

$\Gamma(\pi^+ J/\psi)/\Gamma_{\text{total}}$ Γ_2/Γ

VALUE	DOCUMENT ID		TECN	COMMENT
seen	[1] CHILIKIN	14	BELL	$\overline{B}^0 \to K^-\pi^+ J/\psi$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
not seen	[2] AUBERT	09AA	BABR	$B \to K\pi^+ J/\psi$

[1] CHILIKIN 14 reports $\mathrm{B}(\overline{B}^0 \to X(4430)^+ K^-) \times \mathrm{B}(X(4430)^+ \to J/\psi\pi^+) = (5.4^{+4.0}_{-1.0}{}^{+1.1}_{-0.9})\times 10^{-6}$.

[2] AUBERT 09AA quotes $\mathrm{B}(B^+ \to \overline{K}^0 X(4430)^+) \times \mathrm{B}(X(4430)^+ \to \pi^+ J/\psi) < 1.5\times 10^{-5}$ and $\mathrm{B}(\overline{B}^0 \to K^- X(4430)^+) \times \mathrm{B}(X(4430)^+ \to \pi^+ J/\psi) < 0.4\times 10^{-5}$ at 95% CL.

$X(4430)^{\pm}$ REFERENCES

AAIJ	15BH	PR D92 112009	R. Aaij *et al.*	(LHCb Collab.)
AAIJ	14AG	PRL 112 222002	R. Aaij *et al.*	(LHCb Collab.) JP
CHILIKIN	14	PR D90 112009	K. Chilikin *et al.*	(BELLE Collab.)
CHILIKIN	13	PR D88 074026	K. Chilikin *et al.*	(BELLE Collab.) JP
AUBERT	09AA	PR D79 112001	B. Aubert *et al.*	(BABAR Collab.)
MIZUK	09	PR D80 031104	R. Mizuk *et al.*	(BELLE Collab.)
CHOI	08	PRL 100 142001	S.-K. Choi *et al.*	(BELLE Collab.)