

**X(4430)<sup>±</sup>**

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

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

**X(4430)<sup>±</sup> MASS**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>4478<sup>+15</sup><sub>-18</sub> OUR AVERAGE</b>			
4475 ± 7 <sup>+15</sup> <sub>-25</sub>	1 AAIJ	14AG LHCb	$B^0 \rightarrow K^+ \pi^- \psi(2S)$
4485 ± 22 <sup>+28</sup> <sub>-11</sub>	1 CHILIKIN	13 BELL	$B^0 \rightarrow K^+ \pi^- \psi(2S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
4443 <sup>+15+19</sup> <sub>-12-13</sub>	2 MIZUK	09 BELL	$B \rightarrow K \pi^+ \psi(2S)$
4433 ± 4 ± 2	3 CHOI	08 BELL	$B \rightarrow K \pi^+ \psi(2S)$

<sup>1</sup> From a four-dimensional amplitude analysis.

<sup>2</sup> From a Dalitz plot analysis. Superseded by CHILIKIN 13.

<sup>3</sup> Superseded by MIZUK 09 and CHILIKIN 13.

**X(4430)<sup>±</sup> WIDTH**

<u>VALUE (MeV)</u>	<u>DOCUMENT ID</u>	<u>TECN</u>	<u>COMMENT</u>
<b>181 ± 31 OUR AVERAGE</b>			
172 ± 13 <sup>+37</sup> <sub>-34</sub>	1 AAIJ	14AG LHCb	$B^0 \rightarrow K^+ \pi^- \psi(2S)$
200 <sup>+41+26</sup> <sub>-46-35</sub>	1 CHILIKIN	13 BELL	$B^0 \rightarrow K^+ \pi^- \psi(2S)$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●			
107 <sup>+86+74</sup> <sub>-43-56</sub>	2 MIZUK	09 BELL	$B \rightarrow K \pi^+ \psi(2S)$
45 <sup>+18+30</sup> <sub>-13-13</sub>	3 CHOI	08 BELL	$B \rightarrow K \pi^+ \psi(2S)$

<sup>1</sup> From a four-dimensional amplitude analysis.

<sup>2</sup> From a Dalitz plot analysis. Superseded by CHILIKIN 13.

<sup>3</sup> Superseded by MIZUK 09 and CHILIKIN 13.

**X(4430)<sup>±</sup> DECAY MODES**

Mode	Fraction ( $\Gamma_i/\Gamma$ )
$\Gamma_1 \quad \pi^+ \psi(2S)$	seen
$\Gamma_2 \quad \pi^+ J/\psi$	seen

**X(4430)<sup>±</sup> BRANCHING RATIOS** **$\Gamma(\pi^+ \psi(2S))/\Gamma_{\text{total}}$**   **$\Gamma_1/\Gamma$** 

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

<sup>1</sup> From a four-dimensional amplitude analysis. No product of branching fractions quoted.<sup>2</sup> From a four-dimensional amplitude analysis. Measured a product of branching fractions  $B(B^0 \rightarrow X(4430)^- K^+) \times B(X(4430)^- \rightarrow \psi(2S) \pi^-) = (6.0^{+1.7+2.5}_{-2.0-1.4}) \times 10^{-5}$ .<sup>3</sup> AUBERT 09AA quotes  $B(B^+ \rightarrow \bar{K}^0 X(4430)^+) \times B(X(4430)^+ \rightarrow \pi^+ \psi(2S)) < 4.7 \times 10^{-5}$  and  $B(\bar{B}^0 \rightarrow K^- X(4430)^+) \times B(X(4430)^+ \rightarrow \pi^+ \psi(2S)) < 3.1 \times 10^{-5}$  at 95% CL.<sup>4</sup> Measured a product of branching fractions  $B(\bar{B}^0 \rightarrow K^- X(4430)^+) \times B(X(4430)^+ \rightarrow \pi^+ \psi(2S)) = (3.2^{+1.8+5.3}_{-0.9-1.6}) \times 10^{-5}$ . Superseded by CHILIKIN 13. **$\Gamma(\pi^+ J/\psi)/\Gamma_{\text{total}}$**   **$\Gamma_2/\Gamma$** 

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

<sup>1</sup> CHILIKIN 14 reports  $B(\bar{B}^0 \rightarrow X(4430)^+ K^-) \times B(X(4430)^+ \rightarrow J/\psi \pi^+) = (5.4^{+4.0+1.1}_{-1.0-0.9}) \times 10^{-6}$ .<sup>2</sup> AUBERT 09AA quotes  $B(B^+ \rightarrow \bar{K}^0 X(4430)^+) \times B(X(4430)^+ \rightarrow \pi^+ J/\psi) < 1.5 \times 10^{-5}$  and  $B(\bar{B}^0 \rightarrow K^- X(4430)^+) \times B(X(4430)^+ \rightarrow \pi^+ J/\psi) < 0.4 \times 10^{-5}$  at 95% CL.**X(4430)<sup>±</sup> REFERENCES**

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