

$\phi(2170)$

$$I^G(J^{PC}) = 0^-(1^{--})$$

Observed by AUBERT, BE 06D in the initial-state radiation process
 $e^+e^- \rightarrow \phi f_0(980)\gamma$.

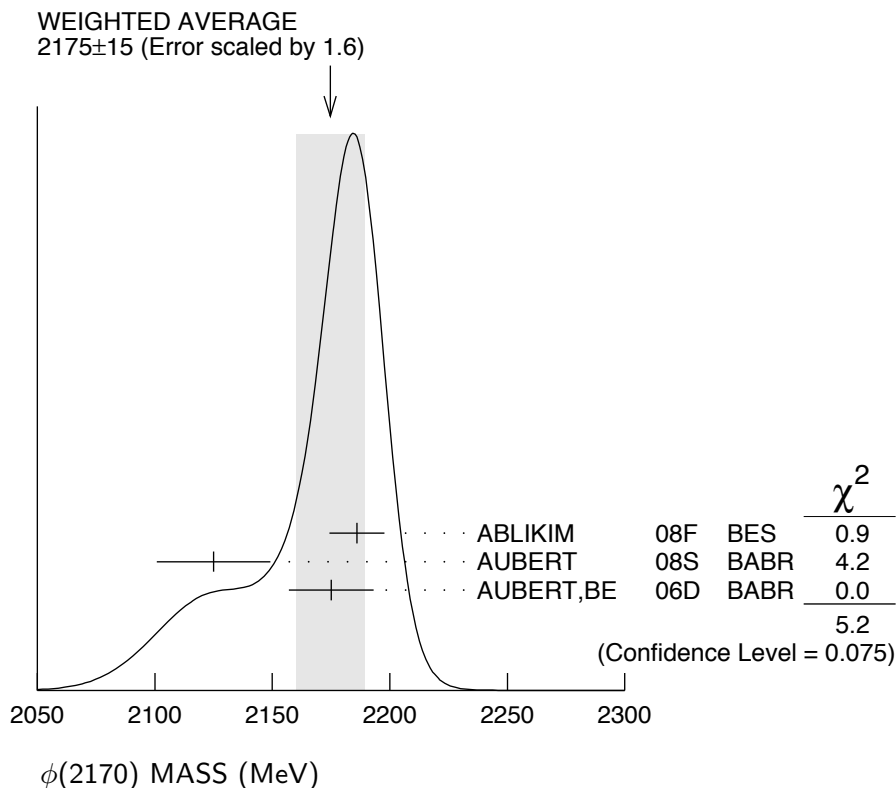
$\phi(2170)$ MASS

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
2175±15 OUR AVERAGE Error includes scale factor of 1.6. See the ideogram below.				
2186±10±6	52	ABLIKIM	08F BES	$J/\psi \rightarrow \eta\phi f_0(980)$
2125±22±10	483	AUBERT	08S BABR	10.6 $e^+e^- \rightarrow \phi\eta\gamma$
2175±10±15	201	¹ AUBERT, BE 06D	BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi\pi\gamma$
● ● ● We do not use the following data for averages, fits, limits, etc. ● ● ●				
2079±13 ⁺⁷⁹ ₋₂₈	4.8k	² SHEN	09 BELL	10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$
2192±14	116 ± 95	³ AUBERT	07AK BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$
2169±20	149 ± 36	³ AUBERT	07AK BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^0\pi^0\gamma$

¹ From the $\phi f_0(980)$ component.

² From a fit with two incoherent Breit-Wigners.

³ From the $K^+K^-f_0(980)$ component.



$\phi(2170)$ WIDTH

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	COMMENT
61 ± 18 OUR AVERAGE				
65 ± 23 ± 17	52	ABLIKIM	08F BES	$J/\psi \rightarrow \eta \phi f_0(980)$
61 ± 50 ± 13	483	AUBERT	08S BABR	$10.6 e^+ e^- \rightarrow \phi \eta \gamma$
58 ± 16 ± 20	201	⁴ AUBERT, BE	06D BABR	$10.6 e^+ e^- \rightarrow K^+ K^- \pi \pi \gamma$
• • • We do not use the following data for averages, fits, limits, etc. • • •				
192 ± 23 ⁺²⁵ ₋₆₁	4.8k	⁵ SHEN	09 BELL	$10.6 e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$
71 ± 21	116 ± 95	⁶ AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow K^+ K^- \pi^+ \pi^- \gamma$
102 ± 27	149 ± 36	⁶ AUBERT	07AK BABR	$10.6 e^+ e^- \rightarrow K^+ K^- \pi^0 \pi^0 \gamma$
⁴ From the $\phi f_0(980)$ component.				
⁵ From a fit with two incoherent Breit-Wigners.				
⁶ From the $K^+ K^- f_0(980)$ component.				

$\phi(2170)$ DECAY MODES

Mode	Fraction (Γ_i/Γ)
$\Gamma_1 e^+ e^-$	seen
$\Gamma_2 \phi \eta$	
$\Gamma_3 \phi \pi \pi$	
$\Gamma_4 \phi f_0(980)$	seen
$\Gamma_5 K^+ K^- \pi^+ \pi^-$	
$\Gamma_6 K^+ K^- f_0(980) \rightarrow K^+ K^- \pi^+ \pi^-$	seen
$\Gamma_7 K^+ K^- \pi^0 \pi^0$	
$\Gamma_8 K^+ K^- f_0(980) \rightarrow K^+ K^- \pi^0 \pi^0$	seen
$\Gamma_9 K^{*0} K^\pm \pi^\mp$	not seen
$\Gamma_{10} K^*(892)^0 \bar{K}^*(892)^0$	not seen

$\phi(2170) \Gamma(i)\Gamma(e^+ e^-)/\Gamma(\text{total})$

$\Gamma(\phi \eta) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\Gamma_2 \Gamma_1/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
• • • We do not use the following data for averages, fits, limits, etc. • • •				
1.7 ± 0.7 ± 1.3	483	AUBERT	08S BABR	$10.6 e^+ e^- \rightarrow \phi \eta \gamma$

$\Gamma(\phi f_0(980)) \times \Gamma(e^+ e^-)/\Gamma_{\text{total}}$ $\Gamma_4 \Gamma_1/\Gamma$

VALUE (eV)	EVTS	DOCUMENT ID	TECN	COMMENT
2.5 ± 0.8 ± 0.4	201	⁷ AUBERT, BE	06D BABR	$10.6 e^+ e^- \rightarrow K^+ K^- \pi \pi \gamma$

⁷ From the $\phi f_0(980)$ component.

$\phi(2170) \Gamma(i)\Gamma(e^+e^-)/\Gamma^2(\text{total})$

$$\frac{\Gamma(\phi\pi\pi)/\Gamma_{\text{total}} \times \Gamma(e^+e^-)/\Gamma_{\text{total}}}{\Gamma_3/\Gamma \times \Gamma_1/\Gamma}$$

VALUE (units 10^{-7})	EVTS	DOCUMENT ID	TECN	COMMENT
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• • • We do not use the following data for averages, fits, limits, etc. • • •

1.65 ± 0.15 ± 0.18	4.8k	⁸ SHEN	09 BELL	10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$
⁸ Multiplied by 3/2 to take into account the $\phi\pi^0\pi^0$ mode. Using $B(\phi \rightarrow K^+K^-) = (49.2 \pm 0.6)\%$.				

$\phi(2170)$ BRANCHING RATIOS

$$\frac{\Gamma(K^+K^-f_0(980) \rightarrow K^+K^-\pi^+\pi^-)/\Gamma_{\text{total}}}{\Gamma_6/\Gamma}$$

VALUE	DOCUMENT ID	TECN	COMMENT
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seen	AUBERT	07AK BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$
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$$\frac{\Gamma(K^+K^-f_0(980) \rightarrow K^+K^-\pi^0\pi^0)/\Gamma_{\text{total}}}{\Gamma_8/\Gamma}$$

VALUE	DOCUMENT ID	TECN	COMMENT
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seen	AUBERT	07AK BABR	10.6 $e^+e^- \rightarrow K^+K^-\pi^0\pi^0\gamma$
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$$\frac{\Gamma(K^{*0}K^\pm\pi^\mp)/\Gamma_{\text{total}}}{\Gamma_9/\Gamma}$$

VALUE	DOCUMENT ID	TECN	COMMENT
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not seen	AUBERT	07AK BABR	10.6 GeV e^+e^-
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$$\frac{\Gamma(K^*(892)^0\bar{K}^*(892)^0)/\Gamma_{\text{total}}}{\Gamma_{10}/\Gamma}$$

VALUE	DOCUMENT ID	TECN	COMMENT
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not seen	ABLIKIM	10C BES2	$J/\psi \rightarrow \eta K^+\pi^-K^-\pi^+$
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$\phi(2170)$ REFERENCES

ABLIKIM	10C	PL B685 27	M. Ablikim <i>et al.</i>	(BES II Collab.)
SHEN	09	PR D80 031101R	C.P. Shen <i>et al.</i>	(BELLE Collab.)
ABLIKIM	08F	PRL 100 102003	M. Ablikim <i>et al.</i>	(BES Collab.)
AUBERT	08S	PR D77 092002	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT	07AK	PR D76 012008	B. Aubert <i>et al.</i>	(BABAR Collab.)
AUBERT, BE	06D	PR D74 091103R	B. Aubert <i>et al.</i>	(BABAR Collab.)