

$\phi(2170)$

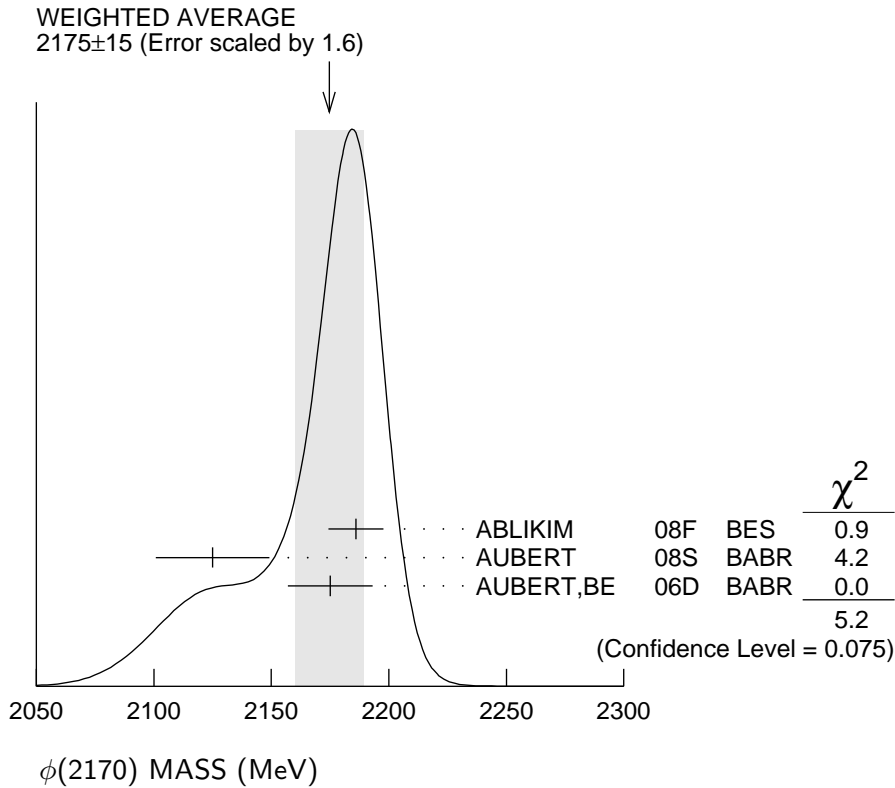
$$I^G(J^{PC}) = 0^-(1^{--})$$

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				
$65 \pm 23 \pm 17$	52	ABLIKIM	08F BES	$J/\psi \rightarrow \eta \phi f_0(980)$
$61 \pm 50 \pm 13$	483	AUBERT	08S BABR	$10.6 e^+ e^- \rightarrow \phi \eta \gamma$
$58 \pm 16 \pm 20$	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. ● ● ●				
$192 \pm 23^{+25}_{-61}$	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)
Γ_1 $e^+ e^-$	seen
Γ_2 $\phi \eta$	
Γ_3 $\phi \pi \pi$	
Γ_4 $\phi f_0(980)$	seen
Γ_5 $K^+ K^- \pi^+ \pi^-$	
Γ_6 $K^+ K^- f_0(980) \rightarrow K^+ K^- \pi^+ \pi^-$	seen
Γ_7 $K^+ K^- \pi^0 \pi^0$	
Γ_8 $K^+ K^- f_0(980) \rightarrow K^+ K^- \pi^0 \pi^0$	seen
Γ_9 $K^{*0} K^\pm \pi^\mp$	not seen
Γ_{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. ● ● ●					
$1.7 \pm 0.7 \pm 1.3$	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	
$2.5 \pm 0.8 \pm 0.4$	201	⁷ AUBERT, BE	06D BABR	$10.6 e^+ e^- \rightarrow K^+ K^- \pi \pi \gamma$	
⁷ From the $\phi f_0(980)$ component.					

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

$\Gamma(\phi\pi\pi)/\Gamma_{\text{total}} \times \Gamma(e^+e^-)/\Gamma_{\text{total}}$	$\Gamma_3/\Gamma \times \Gamma_1/\Gamma$
<u>VALUE (units 10^{-7})</u> <u>EVTS</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	

• • • 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

$\Gamma(K^+K^-f_0(980) \rightarrow K^+K^-\pi^+\pi^-)/\Gamma_{\text{total}}$	Γ_6/Γ
<u>VALUE</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
seen	AUBERT 07AK BABR 10.6 $e^+e^- \rightarrow K^+K^-\pi^+\pi^-\gamma$

$\Gamma(K^+K^-f_0(980) \rightarrow K^+K^-\pi^0\pi^0)/\Gamma_{\text{total}}$	Γ_8/Γ
<u>VALUE</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
seen	AUBERT 07AK BABR 10.6 $e^+e^- \rightarrow K^+K^-\pi^0\pi^0\gamma$

$\Gamma(K^{*0}K^\pm\pi^\mp)/\Gamma_{\text{total}}$	Γ_9/Γ
<u>VALUE</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
not seen	AUBERT 07AK BABR 10.6 GeV e^+e^-

$\Gamma(K^*(892)^0\bar{K}^*(892)^0)/\Gamma_{\text{total}}$	Γ_{10}/Γ
<u>VALUE</u> <u>DOCUMENT ID</u> <u>TECN</u> <u>COMMENT</u>	
not seen	ABLIKIM 10C BES2 $J/\psi \rightarrow \eta K^+\pi^-K^-\pi^+$

$\phi(2170)$ REFERENCES

ABLIKIM	10C	PL B685 27	M. Ablikim <i>et al.</i>	(BES II Collab.)
SHEN	09	PR D80 031101	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 091103	B. Aubert <i>et al.</i>	(BABAR Collab.)