

**$K^*(1410)$** 

$$I(J^P) = \frac{1}{2}(1^-)$$

 **$K^*(1410)$  T-MATRIX POLE  $\sqrt{s}$** Note that  $\Gamma = -2 \text{Im}(\sqrt{s})$ .

VALUE (MeV)	DOCUMENT ID	TECN	COMMENT
<b><math>(1368 \pm 38) - i(106^{+48}_{-59})</math> OUR ESTIMATE</b>			
$(1368 \pm 38) - i(106^{+48}_{-59})$	<sup>1</sup> PELAEZ	17	RVUE $\pi K \rightarrow \pi K$

<sup>1</sup> Reanalysis of ESTABROOKS 78 and ASTON 88 satisfying Forward Dispersion Relations and using sequences of Pade approximants.

 **$K^*(1410)$  MASS**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT	
<b><math>1414 \pm 15</math> OUR AVERAGE</b>					Error includes scale factor of 1.3.	
$1380 \pm 21 \pm 19$		ASTON	88	LASS	0	11 $K^- p \rightarrow K^- \pi^+ n$
$1420 \pm 7 \pm 10$		ASTON	87	LASS	0	11 $K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$1437 \pm 8 \pm 16$	190k	<sup>1</sup> AAIJ	16N	LHCB		$D^0 \rightarrow (K_S^0 \pi^\mp) K^\pm$
$1426 \pm 8 \pm 24$	190k	<sup>2</sup> AAIJ	16N	LHCB		$D^0 \rightarrow K_S^0 (K^\pm \pi^\mp)$
$1276^{+72}_{-77}$		<sup>3,4</sup> BOITO	09	RVUE		$\tau^- \rightarrow K_S^0 \pi^- \nu_\tau$
$1367 \pm 54$		BIRD	89	LASS	-	11 $K^- p \rightarrow \bar{K}^0 \pi^- p$
$1474 \pm 25$		BAUBILLIER	82B	HBC	0	8.25 $K^- p \rightarrow \bar{K}^0 2\pi n$
$1500 \pm 30$		ETKIN	80	MPS	0	6 $K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$

<sup>1</sup> Using a parametrization for the  $K\pi$   $S$ -wave similar to ASTON 88 with fixed resonance width.<sup>2</sup> Using a  $K\pi$   $S$ -wave parametrization with resonant and non-resonant contributions.<sup>3</sup> From the pole position of the  $K\pi$  vector form factor in the complex  $s$ -plane and using EPIFANOV 07 data.<sup>4</sup> Systematic uncertainties not estimated. **$K^*(1410)$  WIDTH**

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT	
<b><math>232 \pm 21</math> OUR AVERAGE</b>					Error includes scale factor of 1.1.	
$176 \pm 52 \pm 22$		ASTON	88	LASS	0	11 $K^- p \rightarrow K^- \pi^+ n$
$240 \pm 18 \pm 12$		ASTON	87	LASS	0	11 $K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$
• • • We do not use the following data for averages, fits, limits, etc. • • •						
$210 \pm 20 \pm 60$	190k	<sup>1</sup> AAIJ	16N	LHCB		$D^0 \rightarrow (K_S^0 \pi^\mp) K^\pm$
$270 \pm 20 \pm 40$	190k	<sup>1</sup> AAIJ	16N	LHCB		$D^0 \rightarrow K_S^0 (K^\pm \pi^\mp)$
$198^{+61}_{-87}$		<sup>2,3</sup> BOITO	09	RVUE		$\tau^- \rightarrow K_S^0 \pi^- \nu_\tau$
$114 \pm 101$		BIRD	89	LASS	-	11 $K^- p \rightarrow \bar{K}^0 \pi^- p$
$275 \pm 65$		BAUBILLIER	82B	HBC	0	8.25 $K^- p \rightarrow \bar{K}^0 2\pi n$
$500 \pm 100$		ETKIN	80	MPS	0	6 $K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$

- <sup>1</sup> Using a  $K\pi$   $S$ -wave parametrization with resonant and non-resonant contributions.  
<sup>2</sup> From the pole position of the  $K\pi$  vector form factor in the complex  $s$ -plane and using EPIFANOV 07 data.  
<sup>3</sup> Systematic uncertainties not estimated.

### $K^*(1410)$ DECAY MODES

Mode	Fraction ( $\Gamma_i/\Gamma$ )	Confidence level
$\Gamma_1$ $K^*(892)\pi$	> 40 %	95%
$\Gamma_2$ $K\pi$	( $6.6 \pm 1.3$ ) %	
$\Gamma_3$ $K\rho$	< 7 %	95%
$\Gamma_4$ $\gamma K^0$	< 2.3 $\times 10^{-4}$	90%
$\Gamma_5$ $K\phi$	seen	

### $K^*(1410)$ PARTIAL WIDTHS

$\Gamma(\gamma K^0)$					$\Gamma_4$
VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT	
<52.9	90	ALAVI-HARATI02B	KTEV	$K + A \rightarrow K^* + A$	

### $K^*(1410)$ BRANCHING RATIOS

$\Gamma(K\rho)/\Gamma(K^*(892)\pi)$						$\Gamma_3/\Gamma_1$
VALUE	CL%	DOCUMENT ID	TECN	CHG	COMMENT	
<0.17	95	ASTON	84	LASS	0	11 $K^- p \rightarrow \bar{K}^0 2\pi n$

$\Gamma(K\pi)/\Gamma(K^*(892)\pi)$						$\Gamma_2/\Gamma_1$
VALUE	CL%	DOCUMENT ID	TECN	CHG	COMMENT	
<0.16	95	ASTON	84	LASS	0	11 $K^- p \rightarrow \bar{K}^0 2\pi n$

$\Gamma(K\pi)/\Gamma_{\text{total}}$					$\Gamma_2/\Gamma$
VALUE	DOCUMENT ID	TECN	CHG	COMMENT	
$0.066 \pm 0.010 \pm 0.008$	ASTON	88	LASS	0	11 $K^- p \rightarrow K^- \pi^+ n$

$\Gamma(K\phi)/\Gamma_{\text{total}}$					$\Gamma_5/\Gamma$
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
seen	24k	<sup>1</sup> AAIJ	21E	LHCB	$B^+ \rightarrow J/\psi \phi K^+$

<sup>1</sup> From an amplitude analysis of the decay  $B^+ \rightarrow J/\psi \phi K^+$  with a significance of  $7.7 \sigma$ .

## $K^*(1410)$ REFERENCES

AAIJ	21E	PRL 127 082001	R. Aaij <i>et al.</i>	(LHCb Collab.)
PELAEZ	17	EPJ C77 91	J.R. Pelaez, A.Rodas, J.R. de Elvira	
AAIJ	16N	PR D93 052018	R. Aaij <i>et al.</i>	(LHCb Collab.)
BOITO	09	EPJ C59 821	D.R. Boito, R. Escribano, M. Jamin	
EPIFANOV	07	PL B654 65	D. Epifanov <i>et al.</i>	(BELLE Collab.)
ALAVI-HARATI	02B	PRL 89 072001	A. Alavi-Harati <i>et al.</i>	(FNAL KTeV Collab.)
BIRD	89	SLAC-332	P.F. Bird	(SLAC)
ASTON	88	NP B296 493	D. Aston <i>et al.</i>	(SLAC, NAGO, CINC, INUS)
ASTON	87	NP B292 693	D. Aston <i>et al.</i>	(SLAC, NAGO, CINC, INUS)
ASTON	84	PL 149B 258	D. Aston <i>et al.</i>	(SLAC, CARL, OTTA) JP
BAUBILLIER	82B	NP B202 21	M. Baubillier <i>et al.</i>	(BIRM, CERN, GLAS+)
ETKIN	80	PR D22 42	A. Etkin <i>et al.</i>	(BNL, CUNY) JP
ESTABROOKS	78	NP B133 490	P.G. Estabrooks <i>et al.</i>	(MCGI, CARL, DURH+)

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