

$K^*(1410)$

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

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

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

¹ 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	
1414 ± 15 OUR AVERAGE					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	¹ AAIJ	16N	LHCB		$D^0 \rightarrow (K_S^0 \pi^\mp) K^\pm$
$1426 \pm 8 \pm 24$	190k	² AAIJ	16N	LHCB		$D^0 \rightarrow K_S^0 (K^\pm \pi^\mp)$
1276^{+72}_{-77}		^{3,4} BOITO	09	RVUE		$\tau^- \rightarrow K_S^0 \pi^- \nu_\tau$
1367 ± 54		BIRD	89	LASS	-	11 $K^- p \rightarrow \bar{K}^0 \pi^- p$
1474 ± 25		BAUBILLIER	82B	HBC	0	8.25 $K^- p \rightarrow \bar{K}^0 2\pi n$
1500 ± 30		ETKIN	80	MPS	0	6 $K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$

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

VALUE (MeV)	EVTS	DOCUMENT ID	TECN	CHG	COMMENT	
232 ± 21 OUR AVERAGE					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	¹ AAIJ	16N	LHCB		$D^0 \rightarrow (K_S^0 \pi^\mp) K^\pm$
$270 \pm 20 \pm 40$	190k	¹ AAIJ	16N	LHCB		$D^0 \rightarrow K_S^0 (K^\pm \pi^\mp)$
198^{+61}_{-87}		^{2,3} BOITO	09	RVUE		$\tau^- \rightarrow K_S^0 \pi^- \nu_\tau$
114 ± 101		BIRD	89	LASS	-	11 $K^- p \rightarrow \bar{K}^0 \pi^- p$
275 ± 65		BAUBILLIER	82B	HBC	0	8.25 $K^- p \rightarrow \bar{K}^0 2\pi n$
500 ± 100		ETKIN	80	MPS	0	6 $K^- p \rightarrow \bar{K}^0 \pi^+ \pi^- n$

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

$K^*(1410)$ DECAY MODES

	Mode	Fraction (Γ_i/Γ)	Confidence level
Γ_1	$K^*(892)\pi$	> 40 %	95%
Γ_2	$K\pi$	(6.6 ± 1.3) %	
Γ_3	$K\rho$	< 7 %	95%
Γ_4	γK^0	< 2.3 $\times 10^{-4}$	90%
Γ_5	$K\phi$	seen	

$K^*(1410)$ PARTIAL WIDTHS

$\Gamma(\gamma K^0)$					Γ_4
VALUE (keV)	CL%	DOCUMENT ID	TECN	COMMENT	
<52.9	90	ALAVI-HARATI02B	KTEV	$K + A \rightarrow K^* + A$	

$K^*(1410)$ BRANCHING RATIOS

$\Gamma(K\rho)/\Gamma(K^*(892)\pi)$						Γ_3/Γ_1
VALUE	CL%	DOCUMENT ID	TECN	CHG	COMMENT	
<0.17	95	ASTON	84	LASS	0	11 $K^- p \rightarrow \bar{K}^0 2\pi n$

$\Gamma(K\pi)/\Gamma(K^*(892)\pi)$						Γ_2/Γ_1
VALUE	CL%	DOCUMENT ID	TECN	CHG	COMMENT	
<0.16	95	ASTON	84	LASS	0	11 $K^- p \rightarrow \bar{K}^0 2\pi n$

$\Gamma(K\pi)/\Gamma_{\text{total}}$					Γ_2/Γ
VALUE	DOCUMENT ID	TECN	CHG	COMMENT	
$0.066 \pm 0.010 \pm 0.008$	ASTON	88	LASS	0	11 $K^- p \rightarrow K^- \pi^+ n$

$\Gamma(K\phi)/\Gamma_{\text{total}}$					Γ_5/Γ
VALUE	EVTS	DOCUMENT ID	TECN	COMMENT	
seen	24k	¹ AAIJ	21E	LHCB	$B^+ \rightarrow J/\psi \phi K^+$

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

$K^*(1410)$ 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+)
