

# BaBar inputs in HEPData

→ The  $\pi^+\pi^-(\gamma)$  [Th-3GeV] and  $K^+K^-(\gamma)$  [Th-5GeV] measurements not yet uploaded

<https://www.hepdata.net/search/?collaboration=BaBar&page=1&phrases=Cross+Section>

Volunteered to perform cross-checks of the inputs once uploaded, but someone else has to prepare them (standard for HEPData cross-checks)

→ Discussions with Alberto, Andrzej and Graziano on the preparation of these HEPData entries

( see e.g. Alberto's scripts <https://precision-sm.github.io/posts/BaBar-ep-em-to-pip-pim/> - or maybe the goal is different for these scripts? )

→ Agreed on the fact that we want to upload the complete published information on the Xsec with uncertainties & correlations

→ Need to clarify the format: "Standard HEPData" for Xsec, statistical and systematic components; simplified format for the statistical covariance matrix ?

→ It may be useful to discuss the level of detail provided in publication / HEPData for an existing entry (e.g.  $K^+K^-\pi^+\pi^-$ ):

TABLE II: Summary of corrections and systematic uncertainties for the  $e^+e^- \rightarrow K^+K^-\pi^+\pi^-$  cross section measurements. The total correction is the linear sum of the contributions, and the total uncertainty is obtained by summing the individual uncertainties in quadrature.

Source	Correction	Uncertainty
Rad. Corrections	—	1%
Backgrounds	—	2% , $E_{c.m.} < 3.3$ GeV 2-10 % , $E_{c.m.} > 3.3$ GeV
Model Acceptance	—	2%
$\chi^2_{K2\pi}$ Distribution	—	1%
Tracking Efficiency	+3%	1%
Kaon ID Efficiency	—	2%
Photon Efficiency	+1.0%	0.5%
ISR Luminosity	—	1%
Total	+4.0%	4% , $E_{c.m.} < 3.3$ GeV 4-11% , $E_{c.m.} > 3.3$ GeV

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Rivet Analysis

## Abstract (data abstract)

4200 fully reconstructed events being obtained respectively, the centre of mass energy of the interaction being determined by the final state

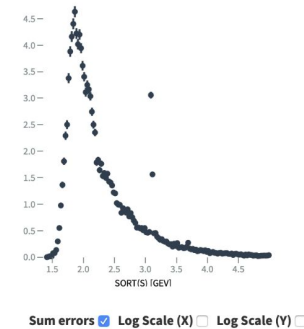
The tables show statistical errors only with the systematic errors as follows:

$E^+E^- \rightarrow K^+K^- \pi^+ \pi^-$ : 4 % for  $ECM < 3.3$  GeV  
 $E^+E^- \rightarrow K^+K^- \pi^+ \pi^-$ : 4-11 % for  $ECM > 3.3$  GeV  
 $E^+E^- \rightarrow K^+K^- \pi^0 \pi^0$ : 7 % for  $ECM < 3.3$  GeV  
 $E^+E^- \rightarrow K^+K^- \pi^0 \pi^0$ : 7-16 % for  $ECM > 3.3$  GeV  
 $E^+E^- \rightarrow K^+K^- K^+K^-$ : 9 % for  $ECM < 3.3$  GeV  
 $E^+E^- \rightarrow K^+K^- K^+K^-$ : 9-13 % for  $ECM > 3.3$  GeV.

Showing all 144 values

RE	$E^+E^- \rightarrow K^+K^- \pi^+ \pi^-$
SQRT(S) [GEV]	SIG [NB]
1.4125	0.0 $\pm 0.004$
1.4375	0.009 $\pm 0.008$
1.4625	0.018 $\pm 0.008$
1.4875	0.014 $\pm 0.01$
1.5125	0.075 $\pm 0.017$
1.5375	0.078 $\pm 0.018$
1.5625	0.135 $\pm 0.022$
1.5875	0.297 $\pm 0.03$

Visualize



→ (I think) the visualisation plot includes statistical uncertainties only

→ It may be preferable to include the split of the systematics in the HEPData table