$\Gamma(\pi^\pm\mu^\mp\nu)/\Gamma(\pi^\pm e^\mp\nu)$ Γ_3/Γ_6

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.697±0.010 OUR FIT					
0.697±0.010 OUR AVERAGE					
0.702±0.011	33k	CHO	80	HBC	
0.662±0.037	10k	WILLIAMS	74	ASPK	
0.741±0.044	6700	BRANDENB...	73	HBC	
0.662±0.030	1309	EVANS	73	HLBC	
0.71 ±0.05	770	BUDAGOV	68	HLBC	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
0.68 ±0.08	3548	BASILE	70	OSPK	
0.71 ±0.04	569	[10] BEILLIERE	69	HLBC	
0.648±0.030	1309	EVANS	69	HLBC	Repl. by EVANS 73
0.67 ±0.13		[11] KULYUKINA	68	CC	
0.82 ±0.10		DEBOUARD	67	OSPK	
0.7 ±0.2	273	HAWKINS	67	HBC	
0.81 ±0.08		HOPKINS	67	HBC	
0.81 ±0.19		ADAIR	64	HBC	

[10] BEILLIERE 69 is a scanning experiment using same exposure as BUDAGOV 68.

[11] KULYUKINA 68 $\Gamma(\pi^\pm\mu^\mp\nu)/\Gamma(\pi^\pm e^\mp\nu)$ is not measured independently from $\Gamma(\pi^+\pi^-\pi^0)/\left[\Gamma(\pi^+\pi^-\pi^0)+\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$ and $\Gamma(\pi^\pm e^\mp\nu)/\left[\Gamma(\pi^+\pi^-\pi^0)+\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$.

$\Gamma(\pi^\pm\mu^\mp\nu)/\left[\Gamma(\pi^+\pi^-\pi^0)+\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$ $\Gamma_3/(\Gamma_2+\Gamma_3+\Gamma_6)$

VALUE	EVTS	DOCUMENT ID		TECN
0.3456±0.0030 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.335 ±0.055	330	[12] KULYUKINA	68	CC
0.39 $^{+0.08}_{-0.10}$	172	[12] ASTBURY	65	CC
0.356 ±0.07	251	[12] LUERS	64	HBC

[12] This mode not measured independently from $\Gamma(\pi^+\pi^-\pi^0)/\left[\Gamma(\pi^+\pi^-\pi^0)+\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$ and $\Gamma(\pi^\pm e^\mp\nu)/\left[\Gamma(\pi^+\pi^-\pi^0)+\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$.

$\Gamma(\pi^\pm e^\mp\nu)/\left[\Gamma(\pi^+\pi^-\pi^0)+\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$ $\Gamma_6/(\Gamma_2+\Gamma_3+\Gamma_6)$

VALUE	EVTS	DOCUMENT ID		TECN
0.4958±0.0032 OUR FIT Error includes scale factor of 1.1.				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.498 ±0.052	500	KULYUKINA	68	CC
0.46 $^{+0.08}_{-0.10}$	202	ASTBURY	65	CC
0.487 ±0.05	153	LUERS	64	HBC
0.46 ±0.11	24	NYAGU	61	CC

$\Gamma(\pi^\pm e^\mp\nu)/\left[\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$ $\Gamma_6/(\Gamma_3+\Gamma_6)$

VALUE	EVTS	DOCUMENT ID		TECN
0.5893±0.0033 OUR FIT				
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.415 ±0.120	320	ASTIER	61	CC

$\left[\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]/\Gamma_{\text{total}}$ $(\Gamma_3+\Gamma_6)/\Gamma$

VALUE	DOCUMENT ID
0.656±0.007 OUR FIT Error includes scale factor of 1.5.	

$\Gamma(2\gamma)/\Gamma_{\text{total}}$ Γ_9/Γ

VALUE (units 10^{-4})	EVTS	DOCUMENT ID		TECN	COMMENT
5.73±0.27 OUR FIT Error includes scale factor of 2.0.					
4.9 ±0.5 OUR AVERAGE					
4.54±0.84		[13] BANNER	72B	OSPK	
4.5 ±1.0	23	ENSTROM	71	OSPK	K^0_L 1.5–9 GeV/c
5.5 ±1.1	90	KUNZ	68	OSPK	Norm.to 3 π(C+N)
6.7 ±2.2	32	TODOROFF	67	OSPK	Repl. CRIEGEE 66
• • • We do not use the following data for averages, fits, limits, etc. • • •					
5.0 ±1.0		[14] REPELLIN	71	OSPK	
7.4 ±1.6	33	[15] CRONIN	67	OSPK	
1.3 ±0.6		[16] CRIEGEE	66	OSPK	

[13] This value uses $(\eta_{00}/\eta_{+-})^2 = 1.05\pm0.14$. In general, $\Gamma(2\gamma)/\Gamma_{\text{total}} = [(4.32\pm0.55)\times 10^{-4}]\,[(\eta_{00}/\eta_{+-})^2]$.

[14] Assumes regeneration amplitude in copper at 2 GeV is 22 mb. To evaluate for a given regeneration amplitude and error, multiply by (regeneration amplitude/22mb)^2.

[15] CRONIN 67 replaced by KUNZ 68.

[16] CRIEGEE 66 replaced by TODOROFF 67.

$\Gamma(2\gamma)/\Gamma(3\pi^0)$ Γ_9/Γ_1

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
2.65±0.16 OUR FIT Error includes scale factor of 1.7.					
2.24±0.22 OUR AVERAGE					
2.13±0.43	28	BARMIN	71	HLBC	
2.24±0.28	115	BANNER	69	OSPK	
2.5 ±0.7	16	ARNOLD	68B	HLBC	Vacuum decay

$\Gamma(2\gamma)/\Gamma(\pi^0\pi^0)$ Γ_9/Γ_{17}

VALUE	EVTS	DOCUMENT ID		TECN
0.627±0.020 OUR FIT Error includes scale factor of 2.3.				
0.632±0.004±0.008	110k	BURKHARDT	87	NA31

$\Gamma(\pi^0 2\gamma)/\Gamma_{\text{total}}$ Γ_{10}/Γ

VALUE (units 10^{-6})	CL%	EVTS	DOCUMENT ID		TECN	COMMENT
1.7 ±0.2 ±0.2		63	BARR	92	SPEC	
• • • We do not use the following data for averages, fits, limits, etc. • • •						
1.86±0.60±0.60		60	PAPADIMITR...	91	E731	$m_{\gamma\gamma} > 280$ MeV
< 5.1	90		PAPADIMITR...	91	E731	$m_{\gamma\gamma} < 264$ MeV
2.1 ±0.6		14	[17] BARR	90C	NA31	$m_{\gamma\gamma} > 280$ MeV
< 2.7	90		PAPADIMITR...	89	E731	In PAPADI...91
<230	90	0	BANNER	69	OSPK	

[17] BARR 90C superseded by BARR 92.

$\Gamma(\pi^0\pi^\pm e^\mp\nu)/\Gamma_{\text{total}}$ Γ_{11}/Γ

VALUE (units 10^{-5})	CL%	EVTS	DOCUMENT ID		TECN
5.18±0.29 OUR AVERAGE					
5.16±0.20±0.22		729	MAKOFF	93	E731
6.2 ±2.0		16	CARROLL	80C	SPEC
• • • We do not use the following data for averages, fits, limits, etc. • • •					
<220	90		[18] DONALDSON	74	SPEC

[18] DONALDSON 74 uses $K^0_L \to \pi^+\pi^-\pi^0/(\text{all } K^0_L)$ decays = 0.126.

$\Gamma((\pi\mu\text{atom})\nu)/\Gamma(\pi^\pm\mu^\mp\nu)$ Γ_{12}/Γ_3

VALUE (units 10^{-7})	EVTS	DOCUMENT ID		TECN
3.90±0.39	155	[19] ARONSON	86	SPEC
• • • We do not use the following data for averages, fits, limits, etc. • • •				
seen	18	COOMBES	76	WIRE

[19] ARONSON 86 quote theoretical value of $(4.31\pm0.08)\times10^{-7}$.

$\Gamma(\pi^\pm e^\mp\nu_e\gamma)/\Gamma(\pi^\pm e^\mp\nu)$ Γ_{13}/Γ_6

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
3.3±2.0	10	PEACH	71	HLBC	γ KE >15 MeV

$\Gamma(\pi^+\pi^-\gamma)/\Gamma_{\text{total}}$ Γ_{14}/Γ

For earlier limits see our 1992 edition Physical Review **D45,** 1 June, Part II (1992).

VALUE (units 10^{-5})	EVTS	DOCUMENT ID		TECN	COMMENT
4.61±0.14 OUR AVERAGE					
4.66±0.15	3136	[20] RAMBERG	93	E731	E_γ >20 MeV
4.41±0.32	1062	[21] CARROLL	80B	SPEC	E_γ >20 MeV
• • • We do not use the following data for averages, fits, limits, etc. • • •					
1.52±0.16	516	[22] CARROLL	80B	SPEC	E_γ >20 MeV
2.89±0.28	546	[23] CARROLL	80B	SPEC	
6.2 ±2.1	24	[24] DONALDSON	74C	SPEC	

[20] RAMBERG 93 finds that fraction of Direct Emission (DE) decays with E_γ >20 MeV is 0.685 ± 0.041.

[21] Both components. Uses $K^0_L \to \pi^+\pi^-\pi^0/(\text{all } K^0_L)$ decays = 0.1239.

[22] Internal Bremsstrahlung component only.

[23] Direct γ emission component only.

[24] Uses $K^0_L \to \pi^+\pi^-\pi^0/(\text{all } K^0_L)$ decays = 0.126.

$\Gamma(\pi^0\pi^0\gamma)/\Gamma_{\text{total}}$ Γ_{15}/Γ

VALUE (units 10^{-6})	DOCUMENT ID		TECN
<5.6	BARR	94	NA31

$\Gamma(\pi^+\pi^-)/\Gamma_{\text{total}}$ Γ_{16}/Γ

Violates CP conservation.

VALUE (units 10^{-3})	DOCUMENT ID		
2.03 ±0.04 OUR FIT Error includes scale factor of 1.2.			
2.102±0.063	[25] ETAFIT	94	

[25] This ETAFIT value is computed from fitted values of $|\eta_{+-}|$, the K^0_L and K^0_S lifetimes, and the $K^0_S \to \pi^+\pi^-$ branching fraction. See the discussion in the "Note on CP violation in K^0_L decay."

$\Gamma(\pi^+\pi^-)/\Gamma(\pi^+\pi^-\pi^0)$ Γ_{16}/Γ_2

Violates CP conservation.

VALUE (units 10^{-2})	EVTS	DOCUMENT ID		TECN	COMMENT
1.639±0.032 OUR FIT Error includes scale factor of 1.1.					
1.64 ±0.04	4200	MESSNER	73	ASPK	$\eta_{+-} = 2.23$

$\Gamma(\pi^+\pi^-)/\left[\Gamma(\pi^\pm\mu^\mp\nu)+\Gamma(\pi^\pm e^\mp\nu)\right]$ $\Gamma_{16}/(\Gamma_3+\Gamma_6)$

Violates CP conservation.

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN	COMMENT
3.09±0.06 OUR FIT Error includes scale factor of 1.2.					
3.08±0.10 OUR AVERAGE					
3.13±0.14	1687	COUPAL	85	SPEC	η_{+-}=2.28 ± 0.06
3.04±0.14	2703	DEVOE	77	SPEC	η_{+-}=2.25 ± 0.05
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.51±0.23	309	[26] DEBOUARD	67	OSPK	η_{+-}=2.00 ± 0.09
2.35±0.19	525	[26] FITCH	67	OSPK	η_{+-}=1.94 ± 0.08

[26] Old experiments excluded from fit. See subsection on η_{+-} in section on "PARAMETERS FOR $K^0_L \to 2\pi$ DECAY" below for average η_{+-} of these experiments and for note on discrepancy.