KALMUS 67 PR 159 1187 +Kernan (LRL)
ZINCHENKO 67 Rutgers Thesis (RUTG)
CALLAHAN 66 NC 44A 90 (WISC)
CALLAHAN 66B PR 150 1153 +Camerini+ (WISC, LRL, UCR, BARI)
CESTER 66 PL 21 343 +Eschstruth, Oneill+ (PPA)
See footnote 1 in AUERBACH 67.
Also 67 PR 155 1505 Auerbach, Dobbs, Mann+ (PENN, PRIN)
BIRGE 65 PR 139B 1600 +Ely, Gidal, Camerini, Cline+ (LRL, WISC)
BISI 65 NC 35 768 +Borreani, Cester, Ferraro+ (TORI)
BISI 65B PR 139B 1068 +Borreani, Marzari-Chiesa, Rinaudo+ (TORI)
BORREANI 65 PR 140B 1686 +Gidal, Rinaudo, Caforio+ (BARI, TORI)
CALLAHAN 65 PRL 15 129 +Cline (WISC)
CAMERINI 65 NC 37 1795 +Cline, Gidal, Kalmus, Kernan (WISC, LRL)
CLINE 65 PL 15 293 +Fry (WISC)
CUTTS 65 PR 138B 969 +Elioff, Stiening (LRL)
DEMARCO 65 PR 140B 1430 +Grosso, Rinaudo (TORI, CERN)
FITCH 65B PR 140B 1088 +Quarles, Wilkins (PRIN, MTHO)
GREINER 65 ARNS 15 67 (LRL)
STAMER 65 PR 138B 440 +Huetter, Koller, Taylor, Grauman (STEV)
TRILLING 65B UCRL 16473 (LRL)
Updated from 1965 Argonne Conference, page 5.
YOUNG 65 UCRL 16362 Thesis (LRL)
Also 67 PR 156 1464 Young, Osborne, Barkas (LRL)
BORREANI 64 PL 12 123 +Rinaudo, Werbrouck (TORI)
CALLAHAN 64 PR 136B 1463 +March, Stark (WISC)
CAMERINI 64 PRL 13 318 +Cline, Fry, Powell (WISC, LRL)
CLINE 64 PRL 13 101 +Fry (WISC)
GIACOMELLI 64 NC 34 1134 +Monti, Quareni+ (BGNA, MUNI)
GREINER 64 PRL 13 284 +Osborne, Barkas (LRL)
JENSEN 64 PR 136B 1431 +Shaklee, Roe, Sinclair (MICH)
KALMUS 64 PRL 13 99 +Kernan, Pu, Powell, Dowd (LRL, WISC)
SHAKLEE 64 PR 136B 1423 +Jensen, Roe, Sinclair (MICH)
BARKAS 63 PRL 11 26 +Dyer, Heckman (LRL)
BOYARSKI 62 PR 128 2398 +Loh, Niemela, Ritson (MIT)
BROWN 62B PRL 8 450 +Kadyk, Trilling, Roe+ (LRL, MICH)
BARKAS 61 PR 124 1209 +Dyer, Mason, Norris, Nickols, Smit (LRL)
BHOWMIK 61 NC 20 857 +Jain, Mathur (DELH)
FERRO-LUZZI 61 NC 22 1087 +Miller, Murray, Rosenfeld+ (LRL)
NORDIN 61 PR 123 2166 (LRL)
ROE 61 PRL 7 346 +Sinclair, Brown, Glaser+ (MICH, LRL)
FREDEN 60B PR 118 564 +Gilbert, White (LRL)
BURROWES 59 PRL 2 117 +Caldwell, Frisch, Hill+ (MIT)
TAYLOR 59 PR 114 359 +Harris, Orear, Lee, Baumel (COLU)
EISENBERG 58 NC 8 663 +Koch, Lohrmann, Nikolic+ (BERN)
ALEXANDER 57 NC 6 478 +Johnston, Oceallaigh (DUUC)
COHEN 57 Fund. Cons. Phys. +Crowe, Dumond (NAAS, LRL, CIT)
COOMBES 57 PR 108 1348 +Cork, Galbraith, Lambertson, Wenzel (LBL)
BIRGE 56 NC 4 834 +Perkins, Peterson, Stork, Whitehead (LRL)
ILOFF 56 PR 102 927 +Goldhaber, Lannutti, Gilbert+ (LRL)

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Rare and Radiative Kaon Decays
RITCHIE 93 RMP 65 1149 +Wojcicki
"Rare K Decays"
BATTISTON 92 PRPL 214 293 +Cocolicchio, Fogli, Paver (PGIA, CERN, TRSTT)
Status and Perspectives of K Decay Physics
BRYMAN 89 IJMP A4 79 (TRIU)
"Rare Kaon Decays"
CHOUNET 72 PRPL 4C 199 +Gaillard, Gaillard (ORSAY, CERN)
FEARING 70 PR D2 542 +Fischbach, Smith (STON, BOHR)
HAIDT 69B PL 29B 696 + (AACH, BARI, CERN, EPOL, NIJM, ORSAY+)
CRONIN 68B Vienna Conf. 241 (PRIN)
Rapporteur talk.
WILLIS 67 Heidelberg Conf. 273 (YALE)
Rapporteur talk.
CABIBBO 66 Berkeley Conf. 33 (CERN)
ADAIR 64 PL 12 67 +Leipuner (YALE, BNL)
CABIBBO 64 PL 9 352 +Maksymowicz (CERN)
Also 64B PL 11 360 Cabibbo, Maksymowicz (CERN)
Also 65 PL 14 72 Cabibbo, Maksymowicz (CERN)
BIRGE 63 PRL 11 35 +Ely, Gidal, Camerini+ (LRL, WISC, BARI)
BLOCK 62B CERN Conf. 371 +Lendinara, Monari (NWES, BGNA)
BRENE 61 NP 22 553 +Egardt, Qvist (NORD)

K^0

$I(J^P) = \frac{1}{2}(0^-)$

K^0 MASS

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	COMMENT
497.672±0.031 OUR FIT					
497.672±0.031 OUR AVERAGE					
497.661±0.033	3713	BARKOV	87B	CMD	$e^+e^- \rightarrow K^0_L K^0_S$
497.742±0.085	780	BARKOV	85B	CMD	$e^+e^- \rightarrow K^0_L K^0_S$
• • • We do not use the following data for averages, fits, limits, etc. • • •					
497.44 ±0.50		FITCH	67	OSPK	
498.9 ±0.5	4500	BALTAY	66	HBC	K^0 from $\overline{p}p$
497.44 ±0.33	2223	KIM	65B	HBC	K^0 from $\overline{p}p$
498.1 ±0.4		CHRISTENS...	64	OSPK	

$m_{K^0} - m_{K^\pm}$

VALUE (MeV)	EVTS	DOCUMENT ID		TECN	CHG	COMMENT
3.995±0.034 OUR FIT Error includes scale factor of 1.1.						
• • • We do not use the following data for averages, fits, limits, etc. • • •						
3.95 ±0.21	417	HILL	68B	DBC	+	$K^+d \rightarrow K^0pp$
3.90 ±0.25	9	BURNSTEIN	65	HBC	−	
3.71 ±0.35	7	KIM	65B	HBC	−	$K^-p \rightarrow n\overline{K}^0$
5.4 ±1.1		CRAWFORD	59	HBC	+	
3.9 ±0.6		ROSENFELD	59	HBC	−	

$\left|m_{K^0} - m_{\overline{K}^0}\right| / m_{\text{average}}$

A test of CPT invariance.

VALUE	DOCUMENT ID
$<9 \times 10^{-19}$ OUR EVALUATION	

K^0 REFERENCES

BARKOV 87B SJNP 46 630 +Vasserman, Vorobev, Ivanov+ (NOVO)
Translated from YAF 46 1088.
BARKOV 85B JETPL 42 138 +Blinov, Vasserman+ (NOVO)
Translated from ZETFP 42 113.
HILL 68B PR 168 1534 +Robinson, Sakitt, Canter (BNL, CMU)
FITCH 67 PR 164 1711 +Roth, Russ, Vernon (PRIN)
BALTAY 66 PR 142 932 +Sandweiss, Stonehill+ (YALE, BNL)
BURNSTEIN 65 PR 138B 895 +Rubin (UMD)
KIM 65B PR 140B 1334 +Kirsch, Miller (COLU)
CHRISTENS... 64 PRL 13 138 Christenson, Cronin, Fitch, Turlay (PRIN)
CRAWFORD 59 PRL 2 112 +Cresti, Good, Stevenson, Ticho (LRL)
ROSENFELD 59 PRL 2 110 +Solmitz, Tripp (LRL)

K^0_S

$I(J^P) = \frac{1}{2}(0^-)$

K^0_S MEAN LIFE

For earlier measurements, beginning with BOLDT 58B, see our our 1986 edition, Physics Letters **170B** 130 (1986).

VALUE (10^{-10} s)	EVTS	DOCUMENT ID		TECN
0.8926±0.0012 OUR AVERAGE				
0.8929±0.0016		GIBBONS	93	E731
0.8920±0.0044	214k	GROSSMAN	87	SPEC
0.881 ±0.009	26k	ARONSON	76	SPEC
0.8913±0.0032		[1] CARITHERS	75	SPEC
0.8937±0.0048	6M	GEWENIGER	74B	ASPK
0.8958±0.0045	50k	[2] SKJEGGEST...	72	HBC
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.905 ±0.007		[3] ARONSON	82B	SPEC
0.867 ±0.024	2173	[4] FACKLER	73	OSPK
0.856 ±0.008	19994	[5] DONALD	68B	HBC
0.872 ±0.009	20000	[5,6] HILL	68	DBC
0.866 ±0.016		[5] ALFF-...	66B	OSPK
0.843 ±0.013	5000	[5] KIRSCH	66	HBC

[1] CARITHERS 75 value is for $m_{K^0_L} - m_{K^0_S}$ $\Delta(m) = 0.5348 \pm 0.0021$. The $\Delta(m)$ dependence of the total decay rate (inverse mean life) is $\Gamma(K^0_S) = [(1.122 \pm 0.004) + 0.16(\Delta(m) - 0.5348)/\Delta(m)]10^{10}$/s. Value would not change with our current $\Delta(m) = 0.5349 \pm 0.0022$.

[2] HILL 68 has been changed by the authors from the published value (0.865 ± 0.009) because of a correction in the shift due to η_{+-}. SKJEGGESTAD 72 and HILL 68 give detailed discussions of systematics encountered in this type of experiment.

[3] ARONSON 82 find that K^0_S mean life may depend on the kaon energy.

[4] FACKLER 73 does not include systematic errors.

[5] Pre-1971 experiments are excluded from the average because of disagreement with later more precise experiments.

[6] HILL 68 has been changed by the authors from the published value (0.865 ± 0.009) because of a correction in the shift due to η_{+-}. SKJEGGESTAD 72 and HILL 68 give detailed discussions of systematics encountered in this type of experiment.

K^0_S DECAY MODES

	Mode		Fraction (Γ_i/Γ)	Scale factor/ Confidence level
Γ_1	$\pi^+\pi^-$		(68.61 ± 0.28) %	S=1.2
Γ_2	$\pi^0\pi^0$		(31.39 ± 0.28) %	S=1.2
Γ_3	$\pi^+\pi^-\gamma$	[a,b]	$(1.78\pm0.05)\times10^{-3}$	
Γ_4	$\gamma\gamma$		$(2.4\ \pm1.2\ )\times10^{-6}$	
Γ_5	$\pi^+\pi^-\pi^0$		$< 8.5 \times10^{-5}$	CL=90%
Γ_6	$3\pi^0$		$< 3.7 \times10^{-5}$	CL=90%
Γ_7	$\pi^\pm e^\mp\nu$	[c]	$(6.68\pm0.10)\times10^{-4}$	S=1.3
Γ_8	$\pi^\pm\mu^\mp\nu$	[c]	$(4.66\pm0.07)\times10^{-4}$	S=1.2
$\Delta S = 1$ weak neutral current ($S1$) modes				
Γ_9	$\mu^+\mu^-$	$S1$	$< 3.2 \times10^{-7}$	CL=90%
Γ_{10}	e^+e^-	$S1$	$< 1.0 \times10^{-5}$	CL=90%
Γ_{11}	$\pi^0e^+e^-$	$S1$	$< 1.1 \times10^{-6}$	CL=90%

[a] See the Full Listings below for the energy limits used in this measurement.

[b] Most of this radiative mode, the low-momentum γ part, is also included in the parent mode listed without γ's.

[c] Calculated from K^0_L semileptonic rates and the K^0_S lifetime assuming $\Delta S = \Delta Q$.