K^0 – THIS IS PART 3 OF 3

To reduce the size of this section's PostScript file, we have divided it into three PostScript files. We present the following index:

PART 1

PART 2

PART 3

A REVIEW GOES HERE – Check our WWW List of Reviews

CP-VIOLATION PARAMETERS IN K^0_L DECAYS

CHARGE ASYMMETRY IN $K^0_{\ell 3}$ DECAYS

Such asymmetry violates *CP*. It is related to Re(ϵ).

δ = weighted average of $\delta(\mu)$ and $\delta(e)$

VALUE (%)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
0.327±0.012 OUR AVERAGE	Includes data from the 2 datablocks that follow this one.				
0.333±0.050	33M	WILLIAMS	73	ASPK	$K_{\mu 3}$ + K_{e3}

$\delta(\mu) = [\Gamma(\pi^- \mu^+ \nu_\mu) - \Gamma(\pi^+ \mu^- \overline{\nu}_\mu)]$/SUM

Only the combined value below is put into the Meson Summary Table.

VALUE (%)	*EVTS*	*DOCUMENT ID*		*TECN*
The data in this block is included in the average printed for a previous datablock.				
0.304±0.025 OUR AVERAGE				
0.313±0.029	15M	GEWENIGER	74	ASPK
0.278±0.051	7.7M	PICCIONI	72	ASPK
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.60 ±0.14	4.1M	MCCARTHY	73	CNTR
0.57 ±0.17	1M	[96] PACIOTTI	69	OSPK
0.403±0.134	1M	[96] DORFAN	67	OSPK

[96] PACIOTTI 69 is a reanalysis of DORFAN 67 and is corrected for $\mu^+ \mu^-$ range difference in MCCARTHY 72.

$\delta(e) = [\Gamma(\pi^- e^+ \nu_e) - \Gamma(\pi^+ e^- \overline{\nu}_e)]$/SUM

Only the combined value below is put into the Meson Summary Table.

VALUE (%)	*EVTS*	*DOCUMENT ID*		*TECN*
The data in this block is included in the average printed for a previous datablock.				
0.333±0.014 OUR AVERAGE				
0.341±0.018	34M	GEWENIGER	74	ASPK
0.318±0.038	40M	FITCH	73	ASPK
0.346±0.033	10M	MARX	70	CNTR
0.246±0.059	10M	[97] SAAL	69	CNTR
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.36 ±0.18	600k	ASHFORD	72	ASPK
0.224±0.036	10M	[97] BENNETT	67	CNTR

[97] SAAL 69 is a reanalysis of BENNETT 67.

PARAMETERS FOR $K^0_L \to 2\pi$ DECAY

η_{+-} = A($K^0_L \to \pi^+\pi^-$) / A($K^0_S \to \pi^+\pi^-$)
η_{00} = A($K^0_L \to \pi^0\pi^0$) / A($K^0_S \to \pi^0\pi^0$)

The fitted values of $|\eta_{+-}|$ and $|\eta_{00}|$ given below are the results of a fit to $|\eta_{+-}|$, $|\eta_{00}|$, $|\eta_{00}/\eta_{+-}|$, and Re(ϵ'/ϵ). Independent information on $|\eta_{+-}|$ and $|\eta_{00}|$ can be obtained from the fitted values of the $K^0_L \to \pi\pi$ and $K^0_S \to \pi\pi$ branching ratios and the K^0_L and K^0_S lifetimes. This information is included as data in the $|\eta_{+-}|$ and $|\eta_{00}|$ sections with a Document ID "BRFIT." See the "Note on *CP* Violation in K^0_L Decay" above for details.

$|\eta_{00}| = |A(K^0_L \to 2\pi^0) / A(K^0_S \to 2\pi^0)|$

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
2.275±0.019 OUR FIT Error includes scale factor of 1.1.				
2.30 ±0.14 OUR AVERAGE				
2.25 ±0.22		[98] BRFIT 96		
2.33 ±0.18		CHRISTENS... 79	ASPK	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.49 ±0.40		[99] ADLER 96B	CPLR	
2.71 ±0.37	56	[100] WOLFF 71	OSPK	Cu reg., 4γ's
2.95 ±0.63		[100] CHOLLET 70	OSPK	Cu reg., 4γ's

[98] This BRFIT value is computed from fitted values of the K^0_L and K^0_S lifetimes and branching fractions to $\pi\pi$. See the discussion in the "Note on *CP* violation in K^0_L decay."

[99] ADLER 96B identified initial neutral kaon individually as being a K^0 or a $\overline{K}^0$. Error is statistical only.

[100] CHOLLET 70 gives $|\eta_{00}|$ = (1.23 ± 0.24)×(regeneration amplitude, 2 GeV/c Cu)/10000mb. WOLFF 71 gives $|\eta_{00}|$ = (1.13 ± 0.12)×(regeneration amplitude, 2 GeV/c Cu)/10000mb. We compute both $|\eta_{00}|$ values for (regeneration amplitude, 2 GeV/c Cu) = 24 ± 2mb. This regeneration amplitude results from averaging over FAISSNER 69, extrapolated using optical-model calculations of Bohm et al., Physics Letters **27B** 594 (1968) and the data of BALATS 71. (From H. Faissner, private communication).

$|\eta_{+-}| = |A(K^0_L \to \pi^+\pi^-) / A(K^0_S \to \pi^+\pi^-)|$

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*	*TECN*	*COMMENT*
2.285±0.019 OUR FIT				
2.284±0.018 OUR AVERAGE				
2.271±0.024		[101] BRFIT 96		
2.310±0.043±0.031		[102] ADLER 95B	CPLR	K^0-$\overline{K}^0$ asymmetry
2.32 ±0.14 ±0.03	10^5	ADLER 92B	SPEC	K^0-$\overline{K}^0$ asymm.
2.27 ±0.12		CHRISTENS... 79B	ASPK	
2.30 ±0.035		GEWENIGER 74B	ASPK	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
2.28 ±0.06	1687	[103] COUPAL 85	SPEC	P(K)=70 GeV/c
2.09 ±0.02		[104] ARONSON 82B	SPEC	E=30–110 GeV

[101] This BRFIT value is computed from fitted values of the K^0_L and K^0_S lifetimes and branching fractions to $\pi\pi$. See the discussion in the "Note on *CP* violation in K^0_L decay."

[102] ADLER 95B report $(2.312 \pm 0.043 \pm 0.030 - 1[\Delta m - 0.5274] + 9.1[\tau_s - 0.8926]) \times 10^{-3}$. We evaluate for our 1996 best values $\Delta m = (0.5304 \pm 0.0014) \times 10^{-10}\ \hbar s^{-1}$ and $\tau_s = (0.8927 \pm 0.0009) \times 10^{-10}$ s.

[103] COUPAL 85 concludes: no energy dependence of $|\eta_{+-}|$, because their value is consistent with above values which occur at lower energies. Not independent of COUPAL 85 $\Gamma(\pi^+\pi^-)/\Gamma(\pi\ell\nu)$ measurement. Enters $|\eta_{+-}|$ via BRFIT value. In editions prior to 1990, this measurement was erroneously also included in our $|\eta_{+-}|$ average and fit. We thank H. Wahl (WAHL 89) for informing us.

[104] ARONSON 82B find that $|\eta_{+-}|$ may depend on the kaon energy.

$|\eta_{00}/\eta_{+-}|$

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*
0.9956±0.0023 OUR FIT Error includes scale factor of 1.8.				
0.9930±0.0020 OUR AVERAGE				
0.9931±0.0020		[105,106] BARR	93D	NA31
0.9904±0.0084±0.0036		[107] WOODS	88	E731
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.9939±0.0013±0.0015	1M	[105] BARR	93D	NA31
0.9899±0.0020±0.0025		[105] BURKHARDT	88	NA31
1.014 ±0.016 ±0.007	3152	BERNSTEIN	85B	SPEC
0.995 ±0.025	1122	BLACK	85	SPEC
1.00 ±0.09		[108] CHRISTENS...	79	ASPK
1.03 ±0.07	124	BANNER	72	OSPK
1.00 ±0.06	167	HOLDER	72	ASPK

[105] This is the square root of the ratio *R* given by BURKHARDT 88 and BARR 93D.

[106] This is the combined results from BARR 93D and BURKHARDT 88, taking into account a common systematic uncertainty of 0.0014.

[107] We calculate $|\eta_{00}/\eta_{+-}| = 1-3(\epsilon'/\epsilon)$ from WOODS 88 (ϵ'/ϵ) value.

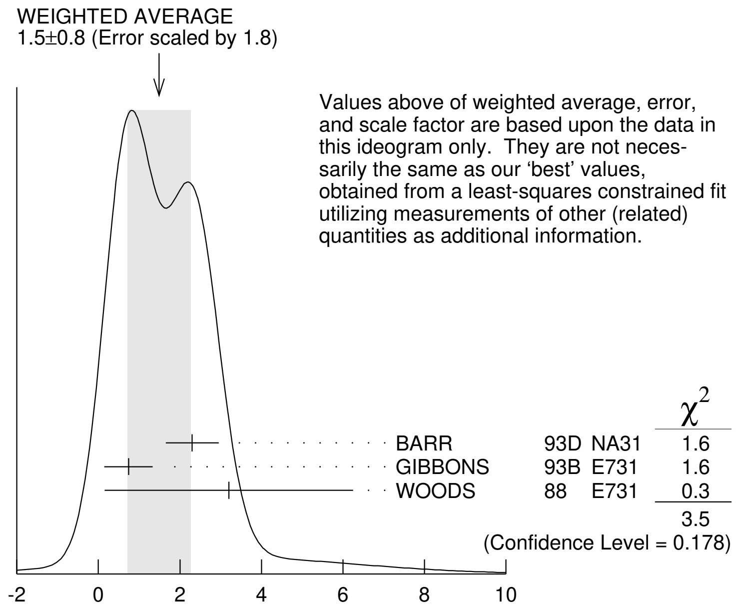
[108] Not independent of $|\eta_{+-}|$ and $|\eta_{00}|$ values which are included in fit.

$\epsilon'/\epsilon \approx \mathrm{Re}(\epsilon'/\epsilon) = (1-|\eta_{00}/\eta_{+-}|)/3$

VALUE (units 10^{-3})	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
1.5 ±0.8 OUR FIT Error includes scale factor of 1.8.					
1.5 ±0.8 OUR AVERAGE Error includes scale factor of 1.8. See the ideogram below.					
2.3 ±0.65		[109,110] BARR	93D	NA31	
0.74±0.52±0.29	>5E5	GIBBONS	93B	E731	
3.2 ±2.8 ±1.2		[109] WOODS	88	E731	
• • • We do not use the following data for averages, fits, limits, etc. • • •					
2.0 ±0.7	1M	[109] BARR	93D	NA31	
−0.4 ±1.4 ±0.6		PATTERSON	90	E731	in GIBBONS 93B
3.3 ±1.1		[109] BURKHARDT	88	NA31	

[109] These values are derived from $|\eta_{00}/\eta_{+-}|$ measurements. They enter the average in this section but enter the fit via the $|\eta_{00}/\eta_{+-}|$ section only.

[110] This is the combined results from BARR 93D and BURKHARDT 88, taking into account their common systematic uncertainty.



$$\epsilon'/\epsilon \approx \mathrm{Re}(\epsilon'/\epsilon) = (1-\left|\eta_{00}/\eta_{+-}\right|)/3$$

ϕ_{+-}, PHASE of η_{+-}

The dependence of the phase on Δm and τ_S is given for each experiment in the comments below, where Δm is the K^0_L-K^0_S mass difference in units 10^{10} $\hbar s^{-1}$ and τ_s is the K_S mean life in units 10^{-10} s. For the "used" data, we have evaluated these mass dependences using our 1996 values, $\Delta m = 0.5304 \pm 0.0014$, $\tau_s = 0.8927 \pm 0.0009$ to obtain the values quoted below. We also give the regeneration phase ϕ_f in the comments below.

OUR FIT is described in the note on "*CP* Violation in K^0_L Decay" in the K^0_L Particle Listings.

VALUE (°)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
43.7 ± 0.6 OUR FIT					
43.6 ± 1.2		[111] ADLER	95B	CPLR	K^0-$\overline{K}^0$ asymmetry
43.9 ± 0.8		[112,113] SCHWINGEN...	95	E773	$CH_{1.1}$ regenerator
42.9 ± 1.0		[113,114] GIBBONS	93	E731	$CH_{1.1}$ regenerator
44.3 ± 1.8		[115] CAROSI	90	NA31	Vacuum regen.
44.5 ± 2.8		[116] CARITHERS	75	SPEC	C regenerator
44.0 ± 1.3		[117] GEWENIGER	74B	ASPK	Vacuum regen.
• • • We do not use the following data for averages, fits, limits, etc. • • •					
43.82 ± 0.63		[118,119] ADLER	96C	RVUE	
42.3 ± 4.4 ± 1.4	10^5	[120] ADLER	92B	SPEC	K^0-$\overline{K}^0$ asymm.
47.7 ± 2.0 ± 0.9		[113,121] KARLSSON	90	E731	
35.3 ± 3.9		[122] ARONSON	82B	SPEC	
41.7 ± 3.5		CHRISTENS...	79B	ASPK	
36.2 ± 6.1		[123] CARNEGIE	72	ASPK	Cu regenerator
37 ± 12		[124] BALATS	71	OSPK	Cu regenerator
40 ± 4		[125] JENSEN	70	ASPK	Vacuum regen.

34	±10	[126] BENNETT	69	CNTR	Cu regenerator
44	±12	[127] BOHM	69B	OSPK	Vacuum regen.
45	± 7	[128] FAISSNER	69	ASPK	Cu regenerator
51	±11	[129] BENNETT	68B	CNTR	Cu reg. uses
70	±21	[130] BOTT-...	67B	OSPK	C regenerator
25	±35	[130] MISCHKE	67	OSPK	Cu regenerator
30	±45	[130] FIRESTONE	66	HBC	
45	±50	[130] FITCH	65	OSPK	Be regenerator

[111] ADLER 95B report $42.7° \pm 0.9° \pm 0.6° + 316[\Delta m - 0.5274]° + 30[\tau_s - 0.8926]°$.

[112] SCHWINGENHEUER 95 reports $\phi_{+-} = 43.53 \pm 0.76 + 173[\Delta m - 0.5282] - 275[\tau_s - 0.8926]$.

[113] These experiments measure $\phi_{+-}-\phi_f$ and calculate the regeneration phase from the power law momentum dependence of the regeneration amplitude using analyticity and dispersion relations. SCHWINGENHEUER 95 [GIBBONS 93] includes a systematic error of 0.35° [0.5°] for uncertainties in their modeling of the regeneration amplitude. See the discussion of these systematic errors, including criticism that they could be underestimated, in the note on "*C* violation in K^0_L decay."

[114] GIBBONS 93 measures $\phi_{+}-\phi_f$ and calculates the regeneration phase ϕ_f from the power law momentum dependence of the regeneration amplitude using analyticity. An error of 0.6° is included for possible uncertainties in the regeneration phase. They find $\phi_{+-} = 42.21 \pm 0.9 + 189\ [\Delta m - 0.5257] - 460\ [\tau_s - 0.8922]°$, as given in SCHWINGENHEUER 95, footnote 8. GIBBONS 93 reports ϕ_{+-} $(42.2 \pm 1.4)°$

[115] CAROSI 90 $\phi_{+-} = 46.9 \pm 1.4 \pm 0.7 + 579\ [\Delta m - 0.5351] + 303\ [\tau_s - 0.8922]°$.

[116] CARITHERS 75 $\phi_{+-} = (45.5 \pm 2.8) + 224[\Delta m - 0.5348]°$. $\phi_f = -40.9 \pm 2.6°$.

[117] GEWENIGER 74B $\phi_{+-} = (49.4 \pm 1.0) + 565[\Delta m - 0.540]°$.

[118] ADLER 96C fit gives $(43.82 \pm 0.41)° + 339(\Delta m - 0.5307)° - 252(\tau_s - 0.8922)°$.

[119] ADLER 96C is the result of a fit which includes nearly the same data as entered into the "OUR FIT" value above.

[120] ADLER 92B quote separately two systematic errors: ±0.4 from their experiment and ±1.0 degrees due to the uncertainty in the value of Δm.

[121] KARLSSON 90 systematic error does not include regeneration phase uncertainty.

[122] ARONSON 82 find that ϕ_{+-} may depend on the kaon energy.

[123] CARNEGIE 72 ϕ_{+-} is insensitive to Δm. $\phi_f = -56.2 \pm 5.2°$.

[124] BALATS 71 $\phi_{+-} = (39.0 \pm 12.0) + 198[\Delta m - 0.544]°$. $\phi_f = -43.0 \pm 4.0°$.

[125] JENSEN 70 $\phi_{+-} = (42.4 \pm 4.0) + 576[\Delta m - 0.538]°$.

[126] BENNETT 69 uses measurement of $(\phi_{+-})-(\phi_f)$ of ALFF-STEINBERGER 66B. BENNETT 69 $\phi_{+-} = (34.9 \pm 10.0) + 69[\Delta m - 0.545]°$. $\phi_f = -49.9 \pm 5.4°$.

[127] BOHM 69B $\phi_{+-} = (41.0 \pm 12.0) + 479(\Delta m - 0.526)°$.

[128] FAISSNER 69 error enlarged to include error in regenerator phase. FAISSNER 69 $\phi_{+-} = (49.3 \pm 7.4) + 205[\Delta m - 0.555]°$. $\phi_f = -42.7 \pm 5.0°$.

[129] BENNETT 69 is a re-evaluation of BENNETT 68B.

[130] Old experiments with large errors not included in average.

ϕ_{00}, PHASE OF η_{00}

See comment in ϕ_{+-} header above for treatment of Δm and τ_s dependence.

OUR FIT is described in the note on "*CP* Violation in K^0_L Decay" in the K^0_L Particle Listings.

VALUE (°)	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
43.5± 1.0 OUR FIT					
44.5± 2.5		[131] CAROSI	90	NA31	

• • • We do not use the following data for averages, fits, limits, etc. • • •

50.8± 7.1±1.7		[132] ADLER	96B	CPLR	
47.4± 1.4±0.9		[133] KARLSSON	90	E731	
55.7± 5.8		CHRISTENS...	79	ASPK	
38.0±25.0	56	[134] WOLFF	71	OSPK	Cu reg., 4γ's
51.0±30.0		[135] CHOLLET	70	OSPK	Cu reg., 4γ's
first quadrant preferred		GOBBI	69B	OSPK	

[131] CAROSI 90 $\phi_{00} = 47.1 \pm 2.1 \pm 1.0 + 579\ [\Delta m - 0.5351] + 252\ [\tau_s - 0.8922]^\circ$.
[132] ADLER 96B identified initial neutral kaon individually as being a K^0 or a $\overline{K}^0$. The systematic uncertainty is $\pm1.5^\circ$ combined in quadrature with $\pm0.8^\circ$ due to Δm.
[133] KARLSSON 90 systematic error does not include regeneration phase uncertainty.
[134] WOLFF 71 uses regenerator phase $\phi_f = -48.2 \pm 3.5^\circ$.
[135] CHOLLET 70 uses regenerator phase $\phi_f = -46.5 \pm 4.4^\circ$.

PHASE DIFFERENCE $\phi_{00} - \phi_{+-}$

Test of *CPT*.

OUR FIT is described in the note on "*CP* Violation in K^0_L Decay" in the K^0_L Particle Listings.

VALUE (°)	*DOCUMENT ID*		*TECN*	*COMMENT*
− 0.2 ± 0.8 OUR FIT				
− 0.3 ± 0.8 OUR AVERAGE				
− 0.30± 0.88	[136] SCHWINGEN...	95		Combined E731, E773
0.2 ± 2.6 ±1.2	[137] CAROSI	90	NA31	
• • • We do not use the following data for averages, fits, limits, etc. • • •				
0.62± 0.71±0.75	SCHWINGEN...	95	E773	
− 1.6 ± 1.2	[138] GIBBONS	93	E731	
− 0.3 ± 2.4 ±1.2	KARLSSON	90	E731	
12.6 ± 6.2	[139] CHRISTENS...	79	ASPK	
7.6 ±18.0	[140] BARBIELLINI	73	ASPK	

[136] This SCHWINGENHEUER 95 values is the combined result of SCHWINGENHEUER 95 and GIBBONS 93, accounting for correlated systematic errors.
[137] CAROSI 90 is excluded from the fit because it it is not independent of ϕ_{+-} and ϕ_{00} values.
[138] GIBBONS 93 give detailed dependence of systematic error on lifetime (see the section on the K^0_S mean life) and mass difference (see the section on $m_{K^0_L} - m_{K^0_S}$).
[139] Not independent of ϕ_{+-} and ϕ_{00} values.
[140] Independent of regenerator mechanism, Δm, and lifetimes.

CHARGE ASYMMETRY IN $\pi^+\pi^-\pi^0$ DECAYS

CHARGE ASYMMETRY j FOR $K^0_L \rightarrow \pi^+\pi^-\pi^0$

Defined at beginning of section "LINEAR COEFFICIENT g FOR $K^0_L \rightarrow \pi^+\pi^-\pi^0$ above. Such asymmetry violates *CP*. See also note on Daltitz plot parameters in $K^\pm$ section and note on *CP* violation in K^0_L decay above.

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*
0.0011±0.0008 OUR AVERAGE				
0.001 ±0.011	6499	CHO	77	
−0.001 ±0.003	4709	PEACH	77	
0.0013±0.0009	3M	SCRIBANO	70	
0.0 ±0.017	4400	SMITH	70	OSPK
0.001 ±0.004	238k	BLANPIED	68	

PARAMETERS for $K^0_L \to \pi^+\pi^-\gamma$ DECAY

$\left|\eta_{+-\gamma}\right| = \left|A(K^0_L \to \pi^+\pi^-\gamma,\ CP\ \text{violating})/A(K^0_S \to \pi^+\pi^-\gamma)\right|$

VALUE (units 10^{-3})	EVTS	DOCUMENT ID		TECN
2.35 ±0.07 OUR AVERAGE				
2.359±0.062±0.040	9045	MATTHEWS	95	E773
2.15 ±0.26 ±0.20	3671	RAMBERG	93B	E731

$\phi_{+-\gamma}$ = phase of $\eta_{+-\gamma}$

VALUE (°)	EVTS	DOCUMENT ID		TECN
44 ± 4 OUR AVERAGE				
43.8± 3.5± 1.9	9045	MATTHEWS	95	E773
72 ±23 ±17	3671	RAMBERG	93B	E731

$\left|\epsilon'_{+-\gamma}\right|/\epsilon$

VALUE	CL%	EVTS	DOCUMENT ID		TECN
<0.3	90	3671	[141] RAMBERG	93B	E731

[141] RAMBERG 93B limit on $\left|\epsilon'_{+-\gamma}\right|/\epsilon$ assumes than any difference between η_{+-} and $\eta_{+-\gamma}$ is due to direct CP violation.

A REVIEW GOES HERE – Check our WWW List of Reviews

$x = A(\overline{K}^0 \to \pi^-\ell^+\nu)/A(K^0 \to \pi^-\ell^+\nu) = A(\Delta S{=}-\Delta Q)/A(\Delta S{=}\Delta Q)$

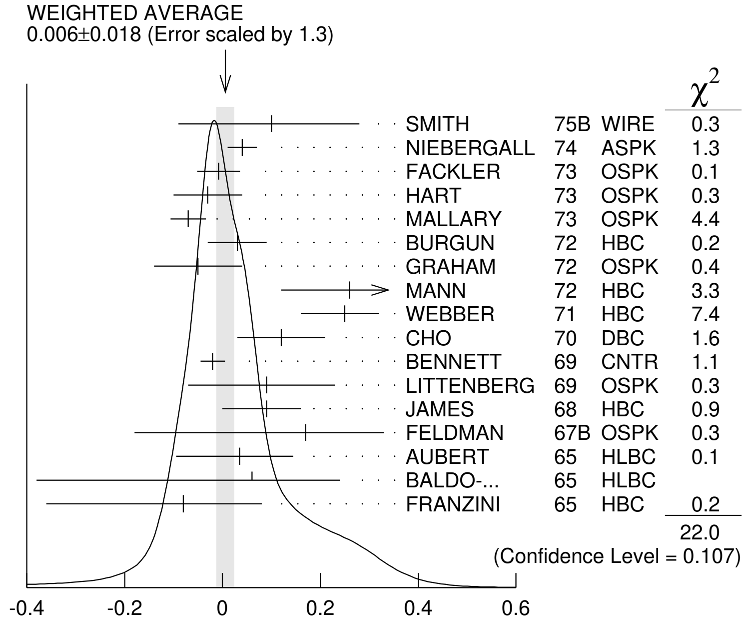
REAL PART OF x

VALUE	EVTS	DOCUMENT ID		TECN	COMMENT
0.006±0.018 OUR AVERAGE		Error includes scale factor of 1.3. See the ideogram below.			
$0.10\ ^{+0.18}_{-0.19}$	79	SMITH	75B	WIRE	$\pi^- p \to K^0 \Lambda$
0.04 ±0.03	4724	NIEBERGALL	74	ASPK	$K^+ p \to K^0 p \pi^+$
−0.008±0.044	1757	FACKLER	73	OSPK	K_{e3} from K^0
−0.03 ±0.07	1367	HART	73	OSPK	K_{e3} from $K^0 \Lambda$
−0.070±0.036	1079	MALLARY	73	OSPK	K_{e3} from $K^0 \Lambda X$
0.03 ±0.06	410	[142] BURGUN	72	HBC	$K^+ p \to K^0 p \pi^+$
−0.05 ±0.09	442	[143] GRAHAM	72	OSPK	$\pi^- p \to K^0 \Lambda$
$0.26\ ^{+0.10}_{-0.14}$	126	MANN	72	HBC	$K^- p \to n \overline{K}^0$
$0.25\ ^{+0.07}_{-0.09}$	252	WEBBER	71	HBC	$K^- p \to n \overline{K}^0$
0.12 ±0.09	215	[144] CHO	70	DBC	$K^+ d \to K^0 p p$
−0.020±0.025		[145] BENNETT	69	CNTR	Charge asym+ Cu regen.
$0.09\ ^{+0.14}_{-0.16}$	686	LITTENBERG	69	OSPK	$K^+ n \to K^0 p$
$0.09\ ^{+0.07}_{-0.09}$	121	JAMES	68	HBC	$\overline{p} p$
$0.17\ ^{+0.16}_{-0.35}$	116	FELDMAN	67B	OSPK	$\pi^- p \to K^0 \Lambda$
$0.035\ ^{+0.11}_{-0.13}$	196	AUBERT	65	HLBC	K^+ charge exchange
$0.06\ ^{+0.18}_{-0.44}$	152	[146] BALDO-...	65	HLBC	K^+ charge exchange
$-0.08\ ^{+0.16}_{-0.28}$	109	[147] FRANZINI	65	HBC	$\overline{p} p$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.04\ {}^{+0.10}_{-0.13}$	100	[143] GRAHAM	72	OSPK	$K_{\mu 3}$ from $K^0\Lambda$
$-0.13\ \pm0.11$	342	[143] MANTSCH	72	OSPK	K_{e3} from $K^0\Lambda$
$0.04\ {}^{+0.07}_{-0.08}$	222	[142] BURGUN	71	HBC	$K^+p\rightarrow\ K^0p\pi^+$
$0.03\ \pm0.03$		[145] BENNETT	68	CNTR	
$0.17\ \pm0.10$	335	[144] HILL	67	DBC	$K^+d\rightarrow\ K^0pp$

[142] BURGUN 72 is a final result which includes BURGUN 71.
[143] First GRAHAM 72 value is second GRAHAM 72 value combined with MANTSCH 72.
[144] CHO 70 is analysis of unambiguous events in new data and HILL 67.
[145] BENNETT 69 is a reanalysis of BENNETT 68.
[146] BALDO-CEOLIN 65 gives x and θ converted by us to Re(x) and Im(x).
[147] FRANZINI 65 gives x and θ for Re(x) and Im(x). See SCHMIDT 67.



Re(x) ($\Delta S = -\Delta Q$ amplitude)

IMAGINARY PART OF *x*

Assumes $m_{K^0_L} - m_{K^0_S}$ positive. See Listings above.

VALUE	*EVTS*	*DOCUMENT ID*		*TECN*	*COMMENT*
$-$0.003$\pm$0.026 OUR AVERAGE	Error includes scale factor of 1.2.				
$-0.10\ {}^{+0.16}_{-0.19}$	79	SMITH	75B	WIRE	$\pi^-p\rightarrow\ K^0\Lambda$
$-0.06\ \pm0.05$	4724	NIEBERGALL	74	ASPK	$K^+p\rightarrow\ K^0p\pi^+$
-0.017 ± 0.060	1757	FACKLER	73	OSPK	K_{e3} from K^0
$0.09\ \pm0.07$	1367	HART	73	OSPK	K_{e3} from $K^0\Lambda$
$0.107{}^{+0.092}_{-0.074}$	1079	MALLARY	73	OSPK	K_{e3} from $K^0\Lambda X$
$0.07\ {}^{+0.06}_{-0.07}$	410	[148] BURGUN	72	HBC	$K^+p\rightarrow\ K^0p\pi^+$

0.05 ± 0.13	442	[149] GRAHAM	72	OSPK	$\pi^- p \to K^0 \Lambda$
$0.21\ ^{+0.15}_{-0.12}$	126	MANN	72	HBC	$K^- p \to n\overline{K}^0$
0.0 ± 0.08	252	WEBBER	71	HBC	$K^- p \to n\overline{K}^0$
-0.08 ± 0.07	215	[150] CHO	70	DBC	$K^+ d \to K^0 pp$
$-0.11\ ^{+0.10}_{-0.11}$	686	LITTENBERG	69	OSPK	$K^+ n \to K^0 p$
$+0.22\ ^{+0.37}_{-0.29}$	121	JAMES	68	HBC	$\overline{p}p$
0.0 ± 0.25	116	FELDMAN	67B	OSPK	$\pi^- p \to K^0 \Lambda$
$-0.21\ ^{+0.11}_{-0.15}$	196	AUBERT	65	HLBC	K^+ charge exchange
$-0.44\ ^{+0.32}_{-0.19}$	152	[151] BALDO-...	65	HLBC	K^+ charge exchange
$+0.24\ ^{+0.40}_{-0.30}$	109	[152] FRANZINI	65	HBC	$\overline{p}p$

• • • We do not use the following data for averages, fits, limits, etc. • • •

$0.12\ ^{+0.17}_{-0.16}$	100	[149] GRAHAM	72	OSPK	$K_{\mu 3}$ from $K^0 \Lambda$
-0.04 ± 0.16	342	[149] MANTSCH	72	OSPK	K_{e3} from $K^0 \Lambda$
$0.12\ ^{+0.08}_{-0.09}$	222	[148] BURGUN	71	HBC	$K^+ p \to K^0 p \pi^+$
-0.20 ± 0.10	335	[150] HILL	67	DBC	$K^+ d \to K^0 pp$

[148] BURGUN 72 is a final result which includes BURGUN 71.
[149] First GRAHAM 72 value is second GRAHAM 72 value combined with MANTSCH 72.
[150] Footnote 10 of HILL 67 should read $+0.58$, not -0.58 (private communication) CHO 70 is analysis of unambiguous events in new data and HILL 67.
[151] BALDO-CEOLIN 65 gives x and θ converted by us to Re(x) and Im(x).
[152] FRANZINI 65 gives x and θ for Re(x) and Im(x). See SCHMIDT 67.

CPT-VIOLATION PARAMETERS IN K^0 DECAY

If *CP*-violating interactions include a *T* conserving part then

$$|K_S\rangle = [|K_1\rangle + (\epsilon + \Delta)|K_2\rangle]/\sqrt{1+|\epsilon+\Delta|^2}$$
$$|K_L\rangle = [|K_2\rangle + (\epsilon - \Delta)|K_1\rangle]/\sqrt{1+|\epsilon-\Delta|^2}$$

where

$$|K_1\rangle = [|K^0\rangle + |\overline{K}^0\rangle]/\sqrt{2}$$
$$|K_2\rangle = [|K^0\rangle - |\overline{K}^0\rangle]/\sqrt{2}$$

and

$$|\overline{K}^0\rangle = CP|K^0\rangle.$$

The parameter Δ specifies the *CPT*-violating part.

Estimates of Δ are given below. See also THOMSON 95 for a test of *CPT*-symmetry conservation in K^0 decays using the Bell-Steinberger relation.

REAL PART OF Δ

A nonzero value violates *CPT* invariance.

VALUE	*EVTS*	*DOCUMENT ID*		*COMMENT*
0.018±0.020	6481	[153] DEMIDOV	95	$K_{\ell 3}$ reanalysis

[153] DEMIDOV 95 reanalyzes data from HART 73 and NIEBERGALL 74.

IMAGINARY PART OF Δ

A nonzero value violates *CPT* invariance.

VALUE	*EVTS*	*DOCUMENT ID*		*COMMENT*
0.021±0.037	6481	[154] DEMIDOV	95	$K_{\ell 3}$ reanalysis

[154] DEMIDOV 95 reanalyzes data from HART 73 and NIEBERGALL 74.

K^0_L REFERENCES

ADLER	96B	ZPHY C70 211	+Alhalel, Angelopoulos+	(CPLEAR Collab.)
ADLER	96C	PL B369 367	+Angelopoulos+	(CPLEAR Collab.)
BRFIT	96	RPP		
ETAFIT	96	RPP		
GU	96	PRL 76 4312	+	(RUTG, UCLA, EFI, COLO, ELMT, FNAL, ILL, OSAK)
LEBER	96	PL B369 69	+Beier+	(MANZ, CERN, EDIN, ORSAY, PISA)
ADLER	95	PL B363 237	+Alhalel, Angelopoulos, Apostolakis+	(CPLEAR Collab.)
ADLER	95B	PL B363 243	+Alhalel, Angelopoulos, Apostolakis+	(CPLEAR Collab.)
AKAGI	95	PR D51 2061	+Fukuhisa, Hemmi+	(TOHOK, TOKY, KYOT, KEK)
BARR	95	ZPHY C65 361	+Buchholz+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
BARR	95C	PL B358 399	+Buchholz+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
DEMIDOV	95	PAN 58 968	+Gusev, Shabalin	(ITEP)
From YAF 58 1041.				
HEINSON	95	PR D51 985	+Horvath, Knibbe, Mathiazhagan+	(BNL E791 Collab.)
KREUTZ	95	ZPHY C65 67	+Holder, Rost+	(SIEG, EDIN, MANZ, ORSAY, PISAI)
MATTHEWS	95	PRL 75 2803	+Gu, Haas, Hogan+	(RUTG, EFI, ELMT, FNAL, ILL)
SCHWINGEN...	95	PRL 74 4376	Schwingenheuer+	(EFI, CHIC, ELMT, FNAL, ILL, RUTG)
SPENCER	95	PRL 74 3323	+	(UCLA, EFI, COLO, ELMT, FNAL, ILL, OSAK, RUTG)
THOMSON	95	PR D51 1412	+Zou	(RUTG)
BARR	94	PL B328 528	+Buchholz+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
GU	94	PRL 72 3000	+	(RUTG, UCLA, EFI, COLO, ELMT, FNAL, ILL, OSAK)
NAKAYA	94	PRL 73 2169	+	(OSAK, UCLA, EFI, COLU, ELMT, FNAL, ILL, RUTG)
ROBERTS	94	PR D50 1874	+	(UCLA, EFI, COLU, ELMT, FNAL, ILL, OSAK, RUTG)
WEAVER	94	PRL 72 3758	+	(UCLA, EFI, COLU, ELMT, FNAL, ILL, OSAK, RUTG)
AKAGI	93	PR D47 R2644	+Fukuhisa, Hemmi+	(TOHOK, TOKY, KYOT, KEK)
ARISAKA	93	PRL 70 1049	+Auerbach, Axelrod, Belz, Biery+	(BNL E791 Collab.)
ARISAKA	93B	PRL 71 3910	+Auerbach, Axelrod, Belz, Biery+	(BNL E791 Collab.)
BARR	93D	PL B317 233	+Buchholz+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
GIBBONS	93	PRL 70 1199	+Barker, Briere, Makoff+	(FNAL E731 Collab.)
GIBBONS	93B	PRL 70 1203	+Barker, Briere, Makoff+	(FNAL E731 Collab.)
GIBBONS	93C	Thesis RX-1487		(CHIC)
HARRIS	93	PRL 71 3914	+	(EFI, UCLA, COLO, ELMT, FNAL, ILL, OSAK, RUTG)
HARRIS	93B	PRL 71 3918	+	(EFI, UCLA, COLO, ELMT, FNAL, ILL, OSAK, RUTG)
MAKOFF	93	PRL 70 1591	+Barker, Briere, Gibbons+	(FNAL E731 Collab.)
Also	95	PRL 75 2069 (erratum)		
RAMBERG	93	PRL 70 2525	+Bock, Coleman, Enagonio, Hsiung+	(FNAL E731 Collab.)
RAMBERG	93B	PRL 70 2529	+Bock, Coleman, Enagonio, Hsiung+	(FNAL E731 Collab.)
VAGINS	93	PRL 71 35	+Adair, Greenlee, Kasha, Mannelli+	(BNL E845 Collab.)
ADLER	92B	PL B286 180	+Alhalel, Angelopoulos, Apostolakis+	(CPLEAR Collab.)
Also	92	SJNP 55 840	Adler, Alhalel, Angelopoulos+	(CPLEAR Collab.)
BARR	92	PL B284 440	+Buchholz+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
GRAHAM	92	PL B295 169	+Barker, Briere, Gibbons, Makoff+	(FNAL E731 Collab.)
MORSE	92	PR D45 36	+Leipuner, Larsen, Jastrzembski+	(BNL, YALE, VASS)
PDG	92	PR D45, 1 June, Part II	Hikasa, Barnett, Stone+	(KEK, LBL, BOST+)
SOMALWAR	92	PRL 68 2580	+Barker, Briere, Gibbons+	(FNAL E731 Collab.)
AKAGI	91	PRL 67 2614	+Fukuhisa, Hemmi+	(TOHOK, TOKY, KYOT, KEK)
AKAGI	91B	PRL 67 2618	+Fukuhisa, Hemmi+	(TOHOK, TOKY, KYOT, KEK)
BARR	91	PL B259 389	+Carosi+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
HEINSON	91	PR D44 R1	+	(UCI, UCLA, LANL, PENN, STAN, TEMP, TEXA+)
PAPADIMITR...	91	PR D44 R573	Papadimitriou, Barker, Briere+	(FNAL E731 Collab.)
BARKER	90	PR D41 3546	+Briere, Gibbons, Makoff+	(FNAL E731 Collab.)
Also	88	PRL 61 2661	Gibbons, Papadimitriou+	(FNAL E731 Collab.)
BARR	90B	PL B240 283	+Carosi+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
BARR	90C	PL B242 523	+Carosi+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
CAROSI	90	PL B237 303	+Clarke+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
KARLSSON	90	PRL 64 2976	+Gollin, Okamitsu, Tschirhart, Barker+	(FNAL E731 Collab.)
OHL	90	PRL 64 2755	+Adair, Greenlee, Kasha, Mannelli+	(BNL E845 Collab.)
OHL	90B	PRL 65 1407	+Adair, Greenlee, Kasha, Mannelli+	(BNL E845 Collab.)
PATTERSON	90	PRL 64 1491	+Barker+	(FNAL E731 Collab.)

INAGAKI	89	PR D40 1712	+Kobayashi, Sato, Shinkawa+	(KEK, TOKY, KYOT)
LITTENBERG	89	PR D39 3322		(BNL)
MATHIAZHA...	89	PRL 63 2181	Mathiazhagan+	(UCI, UCLA, LANL, PENN, STAN+)
MATHIAZHA...	89B	PRL 63 2185	Mathiazhagan+	(UCI, UCLA, LANL, PENN, STAN+)
PAPADIMITR...	89	PRL 63 28	Papadimitriou, Gibbons, Patterson+	(FNAL E731 Collab.)
SCHAFFNER	89	PR D39 990	+Greenlee, Kasha, Mannelli, Ohl+	(YALE, BNL)
WAHL	89	CERN-EP/89-86, H. Wahl — Rare Decay Symposium, Vancouver		(CERN)
BARR	88	PL B214 303	+Clarke+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
BURKHARDT	88	PL B206 169	+Clarke+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
COUSINS	88	PR D38 2914	+Konigsberg+	(UCLA, LASL, PENN, STAN, TEMP, WILL)
GREENLEE	88	PRL 60 893	+Kasha, Mannelli, Mannelli+	(YALE, BNL)
JASTRZEM...	88	PRL 61 2300	Jastrzembski, Larsen, Leipuner, Morse+	(BNL, YALE)
WOODS	88	PRL 60 1695	+Nishikawa, Patterson, Wah, Winstein+	(FNAL E731 Collab.)
BURKHARDT	87	PL B199 139	+	(CERN, EDIN, MANZ, LALO, PISA, SIEG)
ARONSON	86	PR D33 3180	+Bernstein, Bock+	(BNL, CHIC, STAN, WISC)
Also	82	PRL 48 1078	Aronson, Bernstein+	(BNL, CHIC, STAN, WISC)
PDG	86C	PL 170B 132	Aguilar-Benitez, Porter+	(CERN, CIT+)
BERNSTEIN	85B	PRL 54 1631	+Bock, Carlsmith, Coupal+	(CHIC, SACL)
BLACK	85	PRL 54 1628	+Blatt, Campbell, Kasha, Mannelli+	(BNL, YALE)
COUPAL	85	PRL 55 566	+Bernstein, Bock, Carlsmith+	(CHIC, SACL)
BALATS	83	SJNP 38 556	+Berezin, Bogdanov, Vishnevsky+	(ITEP)
		Translated from YAF 38 927.		
BERGSTROM	83	PL 131B 229	+Masso, Singer	(CERN)
ARONSON	82	PRL 48 1078	+Bernstein+	(BNL, CHIC, STAN, WISC)
ARONSON	82B	PRL 48 1306	+Bock, Cheng, Fischbach	(BNL, CHIC, PURD)
Also	82B	PL 116B 73	Fischbach, Cheng+	(PURD, BNL, CHIC)
Also	83	PR D28 476	Aronson, Bock, Cheng+	(BNL, CHIC, PURD)
Also	83B	PR D28 495	Aronson, Bock, Cheng+	(BNL, CHIC, PURD)
PDG	82B	PL 111B 70	Roos, Porter, Aguilar-Benitez+	(HELS, CIT, CERN)
BIRULEV	81	NP B182 1	+Dzhordzhadze, Genchev, Grigalashvili+	(JINR)
Also	80	SJNP 31 622	Birulev, Vestergombi, Genchev+	(JINR)
		Translated from YAF 31 1204.		
CARROLL	80B	PRL 44 529	+Chiang, Kycia, Li, Littenberg, Marx+	(BNL, ROCH)
CARROLL	80C	PL 96B 407	+Chiang, Kycia, Li, Littenberg, Marx+	(BNL, ROCH)
CARROLL	80D	PRL 44 525	+Chiang, Kycia, Li, Littenberg, Marx+	(BNL, ROCH)
CHO	80	PR D22 2688	+Derrick, Miller, Schlereth, Engler+	(ANL, CMU)
MORSE	80	PR D21 1750	+Leipuner, Larsen, Schmidt, Blatt+	(BNL, YALE)
BIRULEV	79	SJNP 29 778	+Vestergombi, Gvakhariya, Genchev+	(JINR)
		Translated from YAF 29 1516.		
CHRISTENS...	79	PRL 43 1209	Christenson, Goldman, Hummel, Roth+	(NYU)
CHRISTENS...	79B	PRL 43 1212	Christenson, Goldman, Hummel, Roth+	(NYU)
HILL	79	NP B153 39	+Sakitt, Snape, Stevens+	(BNL, SLAC, SBER)
SCHMIDT	79	PRL 43 556	+Blatt, Campbell, Grannan+	(YALE, BNL)
SHOCHET	79	PR D19 1965	+Linsay, Grosso-Pilcher, Frisch+	(EFI, ANL)
Also	77	PRL 39 59	Shochet, Linsay, Grosso-Pilcher+	(EFI, ANL)
ENGLER	78B	PR D18 623	+Keyes, Kraemer, Tanaka, Cho+	(CMU, ANL)
HILL	78	PL 73B 483	+Sakitt, Snape, Stevens+	(BNL, SLAC, SBER)
CHO	77	PR D15 587	+Derrick, Lissauer, Miller, Engler+	(ANL, CMU)
CLARK	77	PR D15 553	+Field, Holley, Johnson, Kerth, Sah, Shen	(LBL)
Also	75	Thesis LBL-4275	Shen	(LBL)
DEVOE	77	PR D16 565	+Cronin, Frisch, Grosso-Pilcher+	(EFI, ANL)
DZHORD...	77	SJNP 26 478	Dzhordzhadze, Kekelidze, Krivokhizhin+	(JINR)
		Translated from YAF 26 910.		
PEACH	77	NP B127 399	+Cameron+	(BGNA, EDIN, GLAS, PISA, RHEL)
BIRULEV	76	SJNP 24 178	+Vestergombi, Vovenko, Votruba+	(JINR)
		Translated from YAF 24 340.		
COOMBES	76	PRL 37 249	+Flexer, Hall, Kennelly, Kirkby+	(STAN, NYU)
DONALDSON	76	PR D14 2839	+Hitlin, Kennelly, Kirkby, Liu+	(SLAC)
Also	74	Thesis SLAC-0184	Donaldson	(SLAC)
FUKUSHIMA	76	PRL 36 348	+Jensen, Surko, Thaler+	(PRIN, MASA)
GJESDAL	76	NP B109 118	+Kamae, Presser, Steffen+	(CERN, HEIDH)
REY	76	PR D13 1161	+Cence, Jones, Parker+	(NDAM, HAWA, LBL)
Also	69	PRL 22 1210	Cence, Jones, Peterson, Stenger+	(HAWA, LRL)
BALDO-...	75	NC 25A 688	Baldo-Ceolin, Bobisut, Calimani+	(PADO, WISC)
BLUMENTHAL	75	PRL 34 164	+Frankel, Nagy+	(PENN, CHIC, TEMP)
BUCHANAN	75	PR D11 457	+Drickey, Pepper, Rudnick+	(UCLA, SLAC, JHU)
CARITHERS	75	PRL 34 1244	+Modis, Nygren, Pun+	(COLU, NYU)
SMITH	75B	Thesis UCSD unpub.		(UCSD)
ALBRECHT	74	PL 48B 393		(JINR, BERL, BUDA, PRAG, SERP, SOFI)
BISI	74	PL 50B 504	+Ferrero	(TORI)
DONALDSON	74	Thesis SLAC-0184		(SLAC)
Also	76	PR D14 2839	Donaldson, Hitlin, Kennelly, Kirkby, Liu+	(SLAC)

DONALDSON	74B	PR D9 2960	+Fryberger, Hitlin, Liu+	(SLAC, UCSC)
Also	73B	PRL 31 337	Donaldson, Fryberger, Hitlin, Liu+	(SLAC, UCSC)
DONALDSON	74C	PRL 33 554	+Hitlin, Kennelly, Kirkby+	(SLAC)
Also	74	Thesis SLAC-0184	Donaldson	(SLAC)
Also	76	PR D14 2839	Donaldson, Hitlin, Kennelly, Kirkby, Liu+	(SLAC)
FIELD	74	SLAC-PUB-1498 unpub.		(SLAC)
GEWENIGER	74	PL 48B 483	+Gjesdal, Kamae, Presser+	(CERN, HEIDH)
Also	74	Thesis CERN Int. 74-4	Luth	(CERN)
GEWENIGER	74B	PL 48B 487	+Gjesdal, Presser+	(CERN, HEIDH)
Also	74B	PL 52B 119	Gjesdal, Presser, Steffen+	(CERN, HEIDH)
GEWENIGER	74C	PL 52B 108	+Gjesdal, Presser+	(CERN, HEIDH)
GJESDAL	74	PL 52B 113	+Presser, Kamae, Steffen+	(CERN, HEIDH)
MESSNER	74	PRL 33 1458	+Franklin, Morse+	(COLO, SLAC, UCSC)
NIEBERGALL	74	PL 49B 103	+Regler, Stier+	(CERN, ORSAY, VIEN)
WANG	74	PR D9 540	+Smith, Whatley, Zorn, Hornbostel	(UMD, BNL)
WILLIAMS	74	PRL 33 240	+Larsen, Leipuner, Sapp, Sessoms+	(BNL, YALE)
ALBROW	73	NP B58 22	+Aston, Barber, Bird, Ellison+	(MCHS, DARE)
ALEXANDER	73B	NP B65 301	+Benary, Borowitz, Lande+	(TELA, HEID)
ANIKINA	73	JINR P1 7539	+Balashov, Bannik+	(JINR)
BARBIELLINI	73	PL 43B 529	+Darriulat, Fainberg+	(CERN)
BRANDENB...	73	PR D8 1978	Brandenburg, Johnson, Leith, Loos+	(SLAC)
CARITHERS	73	PRL 31 1025	+Nygren, Gordon+	(COLU, BNL, CERN)
Also	73B	PRL 30 1336	Carithers, Modis, Nygren+	(COLU, CERN, NYU)
EVANS	73	PR D7 36	+Muir, Peach, Budagov+	(EDIN, CERN)
Also	69	PRL 23 427	Evans, Golden, Muir, Peach+	(EDIN, CERN)
FACKLER	73	PRL 31 847	+Frisch, Martin, Smoot, Sompayrac	(MIT)
FITCH	73	PRL 31 1524	+Hepp, Jensen, Strovink, Webb	(PRIN)
Also	72	Thesis COO-3072-13	Webb	(PRIN)
GINSBERG	73	PR D8 3887	+Smith	(MIT, STON)
HART	73	NP B66 317	+Hutton, Field, Sharp, Blackmore+	(CAVE, RHEL)
MALLARY	73	PR D7 1953	+Binnie, Gallivan, Gomez, Peck, Sciulli+	(CIT)
Also	70	PRL 25 1214	Sciulli, Gallivan, Binnie, Gomez+	(CIT)
MCCARTHY	73	PR D7 687	+Brewer, Budnitz, Entis, Graven, Miller+	(LBL)
Also	72	PL 42B 291	McCarthy, Brewer, Budnitz, Entis, Graven+	(LBL)
Also	71	Thesis LBL-550	McCarthy	(LBL)
MESSNER	73	PRL 30 876	+Morse, Nauenberg, Hitlin+	(COLO, SLAC, UCSC)
PEACH	73	PL 43B 441	+Evans, Muir, Hopkins, Krenz	(EDIN, CERN, AACH)
SANDWEISS	73	PRL 30 1002	+Sunderland, Turner, Willis, Keller	(YALE, ANL)
WILLIAMS	73	PRL 31 1521	+Larsen, Leipuner, Sapp, Sessoms+	(BNL, YALE)
ALBROW	72	NP B44 1	+Aston, Barber, Bird, Ellison+	(MCHS, DARE)
ASHFORD	72	PL 38B 47	+Brown, Masek, Maung, Miller, Ruderman+	(UCSD)
BANNER	72	PRL 28 1597	+Cronin, Hoffman, Knapp, Shochet	(PRIN)
BANNER	72B	PRL 29 237	+Cronin, Hoffman, Knapp, Shochet	(PRIN)
BARMIN	72	SJNP 15 636	+Davidenko, Demidov, Dolgolenko+	(ITEP)
		Translated from YAF 15 1149.		
BARMIN	72B	SJNP 15 638	+Barylov, Davidenko, Demidov+	(ITEP)
		Translated from YAF 15 1152.		
BURGUN	72	NP B50 194	+Lesquoy, Muller, Pauli+	(SACL, CERN, OSLO)
CARNEGIE	72	PR D6 2335	+Cester, Fitch, Strovink, Sulak	(PRIN)
DALLY	72	PL 41B 647	+Innocenti, Seppi+	(SLAC, JHU, UCLA)
Also	70	PL 33B 627	Chien, Cox, Ettlinger+	(JHU, SLAC, UCLA)
Also	71	PL 35B 261	Chien, Cox, Ettlinger+	(JHU, SLAC, UCLA)
GRAHAM	72	NC 9A 166	+Abashian, Jones, Mantsch, Orr+	(ILL, NEAS)
HOLDER	72	PL 40B 141	+Radermacher, Staude+	(AACH, CERN, TORI)
JAMES	72	NP B49 1	+Montanet, Paul, Saetre+	(CERN, SACL, OSLO)
KRENZ	72	LNC 4 213	+Hopkins, Evans, Muir, Peach	(AACH, CERN, EDIN)
MANN	72	PR D6 137	+Kofler, Meisner, Hertzbach+	(MASA, BNL, YALE)
MANTSCH	72	NC 9A 160	+Abashian, Graham, Jones, Orr+	(ILL, NEAS)
MCCARTHY	72	PL 42B 291	+Brewer, Budnitz, Entis, Graven+	(LBL)
METCALF	72	PL 40B 703	+Neuhofer, Niebergall+	(CERN, IPN, WIEN)
NEUHOFER	72	PL 41B 642	+Niebergall, Regler, Stier+	(CERN, ORSAY, VIEN)
PICCIONI	72	PRL 29 1412	+Coombes, Donaldson, Dorfan, Fryberger+	(SLAC)
Also	74	PR D9 2939	Piccioni, Donaldson+	(SLAC, UCSC, COLO)
VOSBURGH	72	PR D6 1834	+Devlin, Esterling, Goz, Bryman+	(RUTG, MASA)
Also	71	PRL 26 866	Vosburgh, Devlin, Esterling, Goz+	(RUTG, MASA)
BALATS	71	SJNP 13 53	+Berezin, Vishnevsky, Galanina+	(ITEP)
		Translated from YAF 13 93.		

BARMIN	71	PL 35B 604	+Barylov, Veselovsky, Davidenko+	(ITEP)
BISI	71	PL 36B 533	+Darriulat, Ferrero, Rubbia+	(AACH, CERN, TORI)
BURGUN	71	LNC 2 1169	+Lesquoy, Muller, Pauli+	(SACL, CERN, OSLO)
CARNEGIE	71	PR D4 1	+Cester, Fitch, Strovink, Sulak	(PRIN)
CHAN	71	Thesis LBL-350		(LBL)
CHIEN	71	PL 35B 261	+Cox, Ettlinger+	(JHU, SLAC, UCLA)
Also	72	PL 41B 647	Dally, Innocenti, Seppi+	(SLAC, JHU, UCLA)
CHO	71	PR D3 1557	+Dralle, Canter, Engler, Fisk+	(CMU, BNL, CASE)
CLARK	71	PRL 26 1667	+Elioff, Field, Frisch, Johnson, Kerth+	(LRL)
Also	70	Thesis UCRL 19709	Johnson	(LRL)
Also	71	Thesis UCRL 20264	Frisch	(LRL)
Also	74	SLAC-PUB-1498 unpub.	Field	(SLAC)
ENSTROM	71	PR D4 2629	+Akavia, Coombes, Dorfan+	(SLAC, STAN)
Also	70	Thesis SLAC-0125	Enstrom	(STAN)
JAMES	71	PL 35B 265	+Montanet, Paul, Pauli+	(CERN, SACL, OSLO)
MEISNER	71	PR D3 59	+Mann, Hertzbach, Kofler+	(MASA, BNL, YALE)
PEACH	71	PL 35B 351	+Evans, Muir, Budagov, Hopkins+	(EDIN, CERN)
REPELLIN	71	PL 36B 603	+Wolff, Chollet, Gaillard, Jane+	(ORSAY, CERN)
WEBBER	71	PR D3 64	+Solmitz, Crawford, Alston-Garnjost	(LRL)
Also	68	PRL 21 498	Webber, Solmitz, Crawford, Alston-Garnjost	(LRL)
Also	69	Thesis UCRL 19226	Webber	(LRL)
WOLFF	71	PL 36B 517	+Chollet, Repellin, Gaillard+	(ORSAY, CERN)
ALBROW	70	PL 33B 516	+Aston, Barber, Bird, Ellison+	(MCHS, DARE)
ARONSON	70	PRL 25 1057	+Ehrlich, Hofer, Jensen+	(EFI, ILLC, SLAC)
BARMIN	70	PL 33B 377	+Barylov, Borisov, Bysheva+	(ITEP, JINR)
BASILE	70	PR D2 78	+Cronin, Thevent, Turlay, Zylberajch+	(SACL)
BECHERRAWY	70	PR D1 1452		(ROCH)
BUCHANAN	70	PL 33B 623	+Drickey, Rudnick, Shepard+	(SLAC, JHU, UCLA)
Also	71	Private Comm.	Cox	
BUDAGOV	70	PR D2 815	+Cundy, Myatt, Nezrick+	(CERN, ORSAY, EPOL)
Also	68B	PL 28B 215	Budagov, Cundy, Myatt+	(CERN, ORSAY, EPOL)
CHIEN	70	PL 33B 627	+Cox, Ettlinger+	(JHU, SLAC, UCLA)
Also	71	Private Comm.	Cox	
CHO	70	PR D1 3031	+Dralle, Canter, Engler, Fisk+	(CMU, BNL, CASE)
Also	67	PRL 19 668	Hill, Luers, Robinson, Sakitt+	(BNL, CMU)
CHOLLET	70	PL 31B 658	+Gaillard, Jane, Ratcliffe, Repellin+	(CERN)
CULLEN	70	PL 32B 523	+Darriulat, Deutsch, Foeth+	(AACH, CERN, TORI)
DARRIULAT	70	PL 33B 249	+Ferrero, Grosso, Holder+	(AACH, CERN, TORI)
FAISSNER	70	NC 70A 57	+Reithler, Thome, Gaillard+	(AACH3, CERN, RHEL)
GINSBERG	70	PR D1 229		(HAIF)
JENSEN	70	Thesis		(EFI)
Also	69	PRL 23 615	Jensen, Aronson, Ehrlich, Fryberger+	(EFI, ILL)
MARX	70	PL 32B 219	+Nygren, Peoples+	(COLU, HARV, CERN)
Also	70B	Thesis Nevis 179	Marx	(COLU)
SCRIBANO	70	PL 32B 224	+Mannelli, Pierazzini, Marx+	(PISA, COLU, HARV)
SMITH	70	PL 32B 133	+Wang, Whatley, Zorn, Hornbostel	(UMD, BNL)
WEBBER	70	PR D1 1967	+Solmitz, Crawford, Alston-Garnjost	(LRL)
Also	69	Thesis UCRL 19226	Webber	(LRL)
BANNER	69	PR 188 2033	+Cronin, Liu, Pilcher	(PRIN)
Also	68	PRL 21 1103	Banner, Cronin, Liu, Pilcher	(PRIN)
Also	68	PRL 21 1107	Cronin, Liu, Pilcher	(PRIN)
BEILLIERE	69	PL 30B 202	+Boutang, Limon	(EPOL)
BENNETT	69	PL 29B 317	+Nygren, Saal, Steinberger+	(COLU, BNL)
BOHM	69B	NP B9 605	+Darriulat, Grosso, Kaftanov+	(CERN)
Also	68	PL 27B 321	Bohm, Darriulat, Grosso, Kaftanov	(CERN)
CENCE	69	PRL 22 1210	+Jones, Peterson, Stenger+	(HAWA, LRL)
EVANS	69	PRL 23 427	+Golden, Muir, Peach+	(EDIN, CERN)
FAISSNER	69	PL 30B 204	+Foeth, Staude, Tittel+	(AACH3, CERN, TORI)
FOETH	69	PL 30B 282	+Holder, Radermacher+	(AACH, CERN, TORI)
GAILLARD	69	NC 59A 453	+Galbraith, Hussri, Jane+	(CERN, RHEL, AACH)
Also	67	PRL 18 20	Gaillard, Krienen, Galbraith+	(CERN, RHEL, AACH)
GOBBI	69B	PRL 22 685	+Green, Hakel, Moffett, Rosen, Goz+	(ROCH, RUTG)
LITTENBERG	69	PRL 22 654	+Field, Piccioni, Mehlhop+	(UCSD)
LONGO	69	PR 181 1808	+Young, Helland	(MICH, UCLA)
PACIOTTI	69	Thesis UCRL 19446		(LRL)
SAAL	69	Thesis		(COLU)
ABRAMS	68B	PR 176 1603	+Abashian, Mischke, Nefkens, Smith+	(ILL)
ARNOLD	68B	PL 28B 56	+Budagov, Cundy, Aubert+	(CERN, ORSAY)
ARONSON	68	PRL 20 287	+Chen	(PRIN)
Also	69	PR 175 1708	Aronson, Chen	(PRIN)

BARTLETT	68	PRL 21 558	+Carnegie, Fitch+	(PRIN)
BASILE	68	PL 26B 542	+Cronin, Thevenet, Turlay+	(SACL)
BASILE	68B	PL 28B 58	+Cronin, Thevenet, Turlay, Zylberajch+	(SACL)
BENNETT	68	PL 27B 244	+Nygren, Steinberger+	(COLU, CERN)
BENNETT	68B	PL 27B 248	+Nygren, Steinberger+	(COLU, CERN)
BLANPIED	68	PRL 21 1650	+Levit, Engels+	(CASE, HARV, MCGI)
BOHM	68B	PL 27B 594	+	
BUDAGOV	68	NC 57A 182	+Burmeister, Cundy+	(CERN, ORSAY, IPNP)
Also	68B	PL 28B 215	Budagov, Cundy, Myatt+	(CERN, ORSAY, EPOL)
JAMES	68	NP B8 365	+Briand	(IPNP, CERN)
Also	68	PRL 21 257	Helland, Longo, Young	(UCLA, MICH)
KULYUKINA	68	JETP 26 20	+Mestvirishvili, Nyagu+	(JINR)
		Translated from ZETF 53 29.		
KUNZ	68	Thesis PU-68-46		(PRIN)
BENNETT	67	PRL 19 993	+Nygren, Saal, Steinberger+	(COLU)
BOTT-...	67	PL 24B 194	Bott-Bodenhausen, DeBouard, Cassel+	(CERN)
BOTT-...	67B	PL 24B 438	Bott-Bodenhausen, Debouard, Dekkers+	(CERN)
Also	66B	PL 20 212	Bott-Bodenhausen, Debouard, Cassel+	(CERN)
Also	66	PL 23 277	Bott-Bodenhausen, DeBouard, Cassel+	(CERN)
CRONIN	67	PRL 18 25	+Kunz, Risk, Wheeler	(PRIN)
Also	68	Thesis unpub.	Wheeler	(PRIN)
CRONIN	67B	Princeton 11/67	+Kunz, Risk, Wheeler	(PRIN)
DEBOUARD	67	NC 52A 662	+Dekkers, Jordan, Mermod+	(CERN)
Also	65	PL 15 58	DeBouard, Dekkers, Scharff+	(CERN, ORSAY, MPIM)
DEVLIN	67	PRL 18 54	+Solomon, Shepard, Beall+	(PRIN, UMD)
Also	68	PR 169 1045	Sayer, Beall, Devlin, Shephard+	(UMD, PPA, PRIN)
DORFAN	67	PRL 19 987	+Enstrom, Raymond, Schwartz+	(SLAC, LRL)
FELDMAN	67B	PR 155 1611	+Frankel, Highland, Sloan	(PENN)
FIRESTONE	67	PRL 18 176	+Kim, Lach, Sandweiss+	(YALE, BNL)
FITCH	67	PR 164 1711	+Roth, Russ, Vernon	(PRIN)
GINSBERG	67	PR 162 1570		(MASB)
HAWKINS	67	PR 156 1444		(YALE)
HILL	67	PRL 19 668	+Luers, Robinson, Sakitt+	(BNL, CMU)
HOPKINS	67	PRL 19 185	+Bacon, Eisler	(BNL)
KADYK	67	PRL 19 597	+Chan, Drijard, Oren, Sheldon	(LRL)
KULYUKINA	67	Preprint	+Mestvirishvili, Nyagu+	(JINR)
LOWYS	67	PL 24B 75	+Aubert, Chounet, Pascaud+	(EPOL, ORSAY)
MISCHKE	67	PRL 18 138	+Abashian, Abrams+	(ILL)
NEFKENS	67	PR 157 1233	+Abashian, Abrams, Carpenter, Fisher+	(ILL)
SCHMIDT	67	Thesis Nevis 160		(COLU)
TODOROFF	67	Thesis		(ILL)
ALFF-...	66B	PL 21 595	Alff-Steinberger, Heuer, Kleinknecht+	(CERN)
ANIKINA	66	SJNP 2 339	+Vardenga, Zhuravleva+	(JINR)
		Translated from YAF 2 471.		
AUERBACH	66B	PRL 17 980	+Mann, McFarlane, Sciulli	(PENN)
BASILE	66	Balaton Conf.	+Cronin, Thevenet+	(SACL)
BEHR	66	PL 22 540	+Brisson, Petiau+	(EPOL, MILA, PADO, ORSAY)
BOTT-...	66	PL 23 277	Bott-Bodenhausen, DeBouard, Cassel+	(CERN)
CARPENTER	66	PR 142 871	+Abashian, Abrams, Fisher	(ILL)
CRIEGEE	66	PRL 17 150	+Fox, Frauenfelder, Hanson, Moscat+	(ILL)
FIRESTONE	66	PRL 16 556	+Kim, Lach, Sandweiss+	(YALE, BNL)
HAWKINS	66	PL 21 238		(YALE)
Also	67	PR 156 1444	Hawkins	(YALE)
ANDERSON	65	PRL 14 475	+Crawford, Golden, Stern, Binford+	(LRL, WISC)
ANIKINA	65	JINR P 2488	+Vardenga, Zhuravleva, Kotlya+	(JINR)
ASTBURY	65	PL 16 80	+Finocchiaro, Beusch+	(CERN, ZURI)
Also	65	HPA 39 523	Pepin	
ASTBURY	65B	PL 18 175	+Michelini, Beusch+	(CERN, ZURI)
ASTBURY	65C	PL 18 178	+Michelini, Beusch+	(CERN, ZURI)
AUBERT	65	PL 17 59	+Behr, Canavan, Chounet+	(EPOL, ORSAY)
Also	67	PL 24B 75	Lowys, Aubert, Chounet, Pascaud+	(EPOL, ORSAY)
BALDO-...	65	NC 38 684	Baldo-Ceolin, Calimani, Ciampolillo+	(PADO)
FISHER	65	ANL 7130 83	+Abashian, Abrams, Carpenter+	(ILL)
FITCH	65	PRL 15 73	+Roth, Russ, Vernon	(PRIN)
FRANZINI	65	PR 140B 127	+Kirsch, Plano+	(COLU, RUTG)
GALBRAITH	65	PRL 14 383	+Manning, Jones+	(AERE, BRIS, RHEL)
GUIDONI	65	Argonne Conf. 49	+Barnes, Foelsche, Ferbel, Firestone+	(BNL, YALE)
HOPKINS	65	Argonne Conf. 67	+Bacon, Eisler	(VAND, RUTG)
ADAIR	64	PL 12 67	+Leipuner	(YALE, BNL)
ALEKSANYAN	64B	Dubna Conf. 2 102	+Alikhanyan, Vartazaryan+	(YERE)
Also	64	JETP 19 1019	Aleksanyan+	(LEBD, MPEI, YERE)
		Translated from ZETF 46 1504.		

ANIKINA 64 JETP 19 42 +Zhuravleva+ (GEOR, JINR)
Translated from ZETF 46 59.
CHRISTENS... 64 PRL 13 138 Christenson, Cronin, Fitch, Turlay (PRIN)
FUJII 64 Dubna Conf. 2 146 +Jovanovich, Turkot+ (BNL, UMD, MIT)
LUERS 64 PR 133B 1276 +Mittra, Willis, Yamamoto (BNL)
DARMON 62 PL 3 57 +Rousset, Six (EPOL)
ASTIER 61 Aix Conf. 1 227 +Blaskovic, Rivet, Siaud+ (EPOL)
FITCH 61 NC 22 1160 +Piroue, Perkins (PRIN, LASL)
GOOD 61 PR 124 1223 +Matsen, Muller, Piccioni+ (LRL)
NYAGU 61 PRL 6 552 +Okonov, Petrov, Rosanova, Rusakov (JINR)
Also 61B JETP 13 1138 Nyagu, Okonov, Petrov, Rozanova+ (JINR)
Translated from ZETF 40 1618.
BARDON 58 ANP 5 156 +Lande, Lederman (COLU, BNL)

OTHER RELATED PAPERS

HAYAKAWA 93 PR D48 1150 +Sanda (NAGO)
"Searching for T, CP, CPT, $\Delta S = \Delta Q$ Rule Violations in the Neutral K Meson System: A Guide"
LITTENBERG 93 ARNPS 43 729 +Valencia (BNL, FNAL)
Rare and Radiative Kaon Decays
RITCHIE 93 RMP 65 1149 +Wojcicki
"Rare K Decays"
WINSTEIN 93 RMP 65 1113 +Wolfenstein
"The Search for Direct CP Violation"
BATTISTON 92 PRPL 214 293 +Cocolicchio, Fogli, Paver (PGIA, CERN, TRSTT)
Status and Perspectives of K Decay Physics
DIB 92 PR D46 2265 +Peccei (UCLA)
Tests of CPT conservation in the neutral kaon system.
KLEINKNECHT 92 CNPP 20 281 (MANZ)
New Results on CP Violation in Decays of Neutral K Mesons.
KLEINKNECHT 90 ZPHY C46 S57 (MANZ)
PEACH 90 JPG 16 131 (EDIN)
BRYMAN 89 IJMP A4 79 (TRIU)
"Rare Kaon Decays"
KLEINKNECHT 76 ARNS 26 1 (DORT)
GINSBERG 73 PR D8 3887 +Smith (MIT, STON)
GINSBERG 70 PR D1 229 (HAIF)
HEUSSE 70 LNC 3 449 +Aubert, Pascaud, Vialle (ORSAY)
CRONIN 68C Vienna Conf. 281 (PRIN)
RUBBIA 67 PL 24B 531 +Steinberger (CERN, COLU)
Also 66C PL 23 167 Rubbia, Steinberger (CERN, COLU)
Also 66C PL 20 207 Alff-Steinberger, Heuer, Kleinknecht+ (CERN)
Also 66B PL 21 595 Alff-Steinberger, Heuer, Kleinknecht+ (CERN)
AUERBACH 66 PR 149 1052 +Dobbs, Lande, Mann, Sciulli+ (PENN)
Also 65 PRL 14 192 Auerbach, Lande, Mann, Sciulli, Uto+ (PENN)
FIRESTONE 66B PRL 17 116 +Kim, Lach, Sandweiss+ (YALE, BNL)
BEHR 65 Argonne Conf. 59 +Brisson, Bellotti+ (EPOL, MILA, PADO)
MESTVIRISH... 65 JINR P 2449 Mestvirishvili, Nyagu, Petrov, Rusakov+ (JINR)
TRILLING 65B UCRL 16473 (LRL)
Updated from 1965 Argonne Conference, page 115.
JOVANOV... 63 BNL Conf. 42 Jovanovich, Fischer, Burris+ (BNL, UMD)