[14] D. Luers, I. S. Mittra, W. J. Willis and S. S. Yamamoto, Phys. Rev. B133, 1276 (1964).
[15] M. Kh. Anikina et al., JINR 2339, 1966.
[16] S. A. Anderson, F. S. Crawford, Jr. and R. L. Golden, Phys. Rev. Lett. 14, 475 (1965).
[17] P. Astbury, G. Finocchiaro and R. D. Fortune et al., Phys. Lett. 16, 80 (1965).
[18] P. Astbury, A. Michelini and C. Verkern et al., Phys. Lett. 18, 175 (1965).
[19] P. Franzini, L. Kirsch and P. Schmidt et al., Phys. Rev. B140, 127 (1965).
[20] P. Guidoni and B. Barnes et al., Proceedings of the International Conference on Weak Interactions. Argonne, 1965, p. 49.
[21] H. W. K. Hopkins, T. C. Bacon and F. R. Eisler, Proceedings of the International Conference on Weak Interactions, Argonne, 1965, p. 67.
[22] C. J. B. Hawkins, Phys. Lett. 21, 238 (1966).
[23] Hill, Preprint BNL 10608, 1966.
[24] L. A. Kulyukina, A. N. Mestvirishvili, Tsun-Fan Wu, D. Neagu, N. I. Petrov and V. A. Rusanov, Proceedings of the XIIIth International Conference on High-Energy Physics, Berkeley, 1966, University of California Press 1967, p. 306.
[25] H. W. K. Hopkins, T. C. Bacon and F. R. Eisler, Phys. Rev. Lett. 9, 185 (1967).
[26] V. Bisi, G. Borreani and R. Cester et al., Nuovo Cimento 35, 768 (1965).
[27] A. A. Aleksanyan, A. I. Alikhanyan and I. B. Vartazaryan et al., 12th Intern. Conf. on High-energy Physics, Dubna, 1964, Atomizdat Moscow, 1966, v. 2, p. 102.
[28] S. McKenna, S. Natali and M. O'Connell et al., Nuovo Cimento 10, 763 (1958).
[29] M. Ferro-Luzzi, D. H. Miller and J. J. Murray et al., Nuovo Cimento 22, 1087 (1961).
[30] L. T. Smith, D. J. Prowse and D. H. Stork et al., Phys. Lett. 2, 204 (1962).
[31] Huetter, Phys. Rev. 162, 1028 (1967).
[32] G. E. Kalmus, A. Kernan and R. T. Pu et al., Phys. Rev. Lett. 13, 99 (1965).
[33] A. Abashian, R. J. Abrams and D. W. Carpenter et al., 12th Internat. Conf. on High-energy Physics, Dubna, 1964.
[34] B. M K. Nefkens, A. Abashian and R. J. Abrams, Phys. Rev. 157, 123 (1967).
[35] M. Baldo-Geolin, A. Bonetti and W. D. B. Greening et al., Nuovo Cimento 6, 84 (1957).
[36] C. R. Fletcher, R. W. Beier and R. T. Edwards et al., Phys. Rev. Lett. 19, 98 (1967).

539.12

PROBABILITIES OF WEAK PROCESSES WITH NEUTRAL LEPTON CURRENTS

E. P. SHABALIN

Institute of Theoretical and Experimental Physics, Moscow

Process	Relative probability Γ_i/Γ_{tot}, literature	Ratio to transition with charged lepton current	Proposed value of $\Gamma_i^{e-m}/\Gamma_{tot}$, due to virtual photons, literature
1. $K_L^0 \to \mu^+\mu^-$	$< 1.6\cdot10^{-6}$ [1]	$\Gamma_1/\Gamma(K^+_{\mu\nu}) < 5.4\cdot10^{-7}$	$\sim 10^{-8}$ [1,9]
2. $K_L^0 \to e^+e^-$	$< 1.8\cdot10^{-5}$ [1]	$\Gamma_2/\Gamma(K^+_{e\nu}) < 0.2$	$< 10^{-11}$ [6]
3. $K_S^0 \to \mu^+\mu^-$	$< 7.3\cdot10^{-5}$ [1]	$\Gamma_3/\Gamma(K_{\mu\nu}) < 0.016$	$\sim 10^{-8}$ [7]
4. $K_L^0 \to \mu^\pm e^\mp$	$< 9\cdot10^{-6}$ [1]		$\sim 0{,}25\cdot10^{-7}$ [7]
5. $K^+ \to \pi^+\mu^+\mu^-$	$< 1.3\cdot10^{-6}$ [2]	$\Gamma_5/\Gamma(K^+_{\pi e\nu}) < 3.8\cdot10^{-5}$	$\sim 10^{-7}$ [8]
6. $K^+ \to \pi^+e^+e^-$	$< 1{,}6\cdot10^{-6}$ [2]	$\Gamma_6/\Gamma(K^+_{\pi e\nu}) < 3.3\ 10^{-5}$	$\sim 10^{-6}$ [10]
7. $K^+ \to \pi^+ + \nu_e + \bar{\nu}_e$	$< 1.1\cdot10^{-6}$ [3]	$\Gamma_7/\Gamma(K^+_{\pi e\nu}) < 0.06$	Negligibly small
8. $\nu_\mu + p \to \nu_\mu + p$	[4,5]	$\sigma_8/\sigma(\nu_\mu + n \to \to \mu + p) < 0.03$	If an intermediate W-boson exists, the ratio is $\leqslant \alpha^2$.
9. $\nu_\mu + p \to \nu_\mu + n + \pi^+$	[4,5]	$\sigma_9/\sigma(\nu_\mu + p \to \to p + \pi^+ + \mu^-) < 0{,}16$	

[1] M. Bott-Bodenhausen et al., Phys. Lett. **B24**, 194 (1967).
[2] V. Bisi et al., Phys. Lett. **B25**, 572 (1967).
[3] N. Camerini et al., Phys. Rev. Lett. **13**, 318 (1964).
[4] H. H. Bingham et al., Proc. of the Sienna Conf. on Elementary Particles, 1968, vol. 1, p. 555.
[5] E. P. Shabalin, Yad. Fiz. 8, 74 (1968) [Sov. J. Nuc. Phys. 8, 42 (1969)].
[6] M. A. Bagi Beg, Phys. Rev. **132**, 426 (1963).
[7] M. L. Good et al., Phys. Rev. **151**, 1194 (1967).
[8] N. Cabibbo and E. Ferrary, Nuovo Cimento **18**, 928 (1960).
[9] L. M. Sehgal, Nuovo Cimento **45**, 785 (1966).
[10] M. Baker and S. L. Glashow, Nuovo Cimento **25**, 857 (1962).

539.12

VERIFICATION OF AXIAL INTERACTION IN K^+_{e2} DECAYS

I. S. TSUKERMAN

Experiment	Bowen et al.[1]	Botterill et al.[2]	V–A theory (with allowance for radiative corrections
Decay	K^+_{e2}	K^+_{e2}	
Statistics	7	10	
$\Gamma(K^+_{e2})/\Gamma(K^+_{\mu 2})$	—	$\left(1,9\,^{+0.7}_{-0.5}\right)\cdot 10^{-5}$	$2{,}1\cdot 10^{-5}$
$\Gamma(K^-_{e2})/\Gamma_{tot}(K^-)$	$\left(2,1\,^{+1.8}_{-1.3}\right)\cdot 10^{-5}$	$\left(1,2\,^{+0.5}_{-0.3}\right)\cdot 10^{-5}$	$1{,}44\cdot 10^{-5}$
$\lvert f^P/f^A\rvert$ at 95% confidence level.	$3\cdot 10^{-3}$	$2{,}25\cdot 10^{-3}$	0

$R = \Gamma(K^+_{e2})/\Gamma(K^+_{\mu 2})$, $R = 0.815 R_0$ (the coefficient 0.815 is due to the radiative corrections[3]),

$$R_0 = \frac{(M_K^2 - M_e^2)^2}{(M_K^2 - M_\mu^2)^2}\left|\frac{M_e f^A/M_K + f^P}{M_\mu f^A/M_K + f^P}\right|^2, \quad R_{\exp}/R_{\text{theor}} \approx |1 + 10^3 (f^P/f^A)|^2,$$

where f^A and f^P are the axial and pseudoscalar coupling constants, respectively.

[1] D. R. Bowen et al., Phys. Rev. **154**, 1314 (1967).
[2] D. R. Botterill et al., Phys. Rev. Lett. **19**, 982 (1967).
[3] S. M. Berman, Phys. Rev. Lett. **1**, 468 (1958); D. E. Neville, Phys. Rev. **124**, 2037 (1961).

VERIFICATION OF VECTOR INTERACTION IN K^+_{e3} DECAYS

Experiment	Decay	Statistics	Method*	Measurement	2-probability for pure interaction variants			Admixture to amplitude of scalar and tensor interactions	
					Vector V	Scalar S	Tensor T	$\lvert S/L\rvert$	$\lvert T/V\rvert$
Auerbach et al. [1]	$K^0_{L\beta 3}$	~ 100	SC	Pion-lepton angle	0.875	0.112	0.014 (confidence level)	—	—
Firestone et al. [2]	K^0_{Le3}	~ 760	LHC	E_π–E_e Dalitz distribution	35%	~ 0%	~ 0%	—	—
Callahan et al. [3]	$K^+_{\mu 3}$	~ 2650 ~ 440	HLC	μ spectrum π spectrum	30% 70%	1% 1%	1% 1%	—	—
Bellotti et al. [4]	K^+_{e3}	~ 620	HLC	π-ν angle in ν-e cms	25% a 35% b 28% c	1% 1% ~ 0%	~ 0% 0.1% ~ 0%	— < 0.12 < 0.09	— < 0.06 < 0.09
Cester et al. [5]	K^+_{e3}	~ 1680	SC	e^+ spectrum	39%	~ 0%	~ 0%	0.18 at 90% confidence level	0.04
Kalmus and Kernan [6]	K^+_{e3}	~ 515	HLC	π-ν angle in ν-e cms	10%	—	—	0.3 at 95% confidence level	1.1
Eschstruth et al. [7]	K^+_{e3}	~ 4640 ~ 1390	SC	e^+ spectrum e^+ spectrum and π^0 registration	—	—	—	0.15 0.05 at 90% confidence level	0.40 0.07

*SC–spark chamber, LHC–liquid hydrogen chamber, HLC–heavy liquid chamber