



## Biographical Memoir and Publications of Paul F. Zweifel

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### ABSTRACT

Paul Zweifel served as the founding editor of the Transport Theory and Statistical Physics journal from 1971 to 1981. An overview of his professional life gives a detailed list of his publications, broken down by his research interests, and also illustrates his leadership of the International Conference on Transport Theory meetings over the past 50 years. This paper provides supplementary material to the Paul Frederick Zweifel obituary published in *Physics Today* 70 (8):73 (2017); doi:10.1063/PT.3.3671.

### KEYWORDS

Paul Zweifel; reactor physics; neutron scattering; transport theory; mathematical physics; statistical physics; mathematics of music

Paul was born in New York City on 21 June 1929. At the age of 15 he began his undergraduate studies at Carnegie Institute of Technology (now Carnegie Mellon University) and graduated with a B.S. in Physics in 1948. He received his Ph.D. in Physics from Duke University under the guidance of Eugene Grueling in 1954. The title of his dissertation was “Capture-Positron Branching Ratios”.

In mid-1953, Paul began working on problems in reactor physics and neutron scattering at the Knolls Atomic Power Laboratory before becoming an Associate Professor of Nuclear Engineering at the University of Michigan in 1958; two years later he was promoted to Professor. After moving to Michigan, Paul’s primary research interest really changed once he began collaborating with the late physicist Kenneth M. Case, who made pioneering contributions to neutron transport theory at the Los Alamos Scientific Laboratory during the Manhattan Project. After the publication of Case’s 1960 paper on “Elementary solutions of the transport equation and their applications” [*Ann. Phys.* 9 (1):1–23], Paul, for the next several years, focused most of his attention on transport theory. Two of us (N.J.M. and C.E.S.) were fortunate to take a class on that subject taught by Paul in the autumn of 1962, when he was busy distributing hand-scrawled, dittoed

class handouts that were later incorporated into his book with Case on Linear Transport Theory (Addison-Wesley, 1967).

Paul organized a Michigan Memorial Phoenix Project Conference in June 1964 on fast reactor physics. Notes from his talk at the conference (MMPP-FRPC-64-1), taken and prepared by one of us (N.J.M.), show that at that time Paul and Ken had made substantial progress on their book. The experience of organizing probably his first professional meeting must not have frustrated Paul too much, given his later successes in organizing similar conferences. During a 1964–1965 sabbatical year from Michigan, accompanied by one of us (C.E.S.), at the Middle East Technical University in Ankara, Turkey, Paul and Erdal İnönü organized a 2-week NATO Advanced Study Institute on Transport Theory.

Paul moved to Blacksburg, Virginia in 1968, where he became a Professor of Physics at Virginia Tech and was soon appointed as University Distinguished Professor. In 1969 Paul, along with Bob Erdmann and one of us (C.E.S.), founded the series of conferences that has become known as the International Conference on Transport Theory (ICTT) meetings that continue to be held every 2 years. Because of Paul's leadership and the force of his personality, to date these meetings have been held in the USA (15 times), Italy (4 times), and once in China, Sweden, England, Brazil, Hungary, and Russia; Paul hosted six of the conferences in Blacksburg. The longevity of these conferences is remarkable because they are not affiliated with any professional organization but are sponsored only by various universities and national laboratories.

The journal *Transport Theory and Statistical Physics*, with Paul as its founding editor from 1971 until 1981, has published the proceedings of nearly every ICTT meeting. The journal was retitled in 2014 as *Journal of Computational and Theoretical Transport*, in recognition of the growing importance of numerical techniques in transport theory.

While at Virginia Tech, he was awarded the US Department of Energy's E. O. Lawrence Medal in 1972 and the John Simon Guggenheim Memorial Foundation Fellowship in 1974. Earlier, in 1963, he became a Fellow of the American Physical Society. Paul had a great interest in the history of transport theory. He was very proud to be in the lineage of Ph.D. dissertation advisors that includes J. Stefan  $\implies$  L. E. Boltzmann  $\implies$  P. Ehrenfest  $\implies$  G. Uhlenbeck  $\implies$  E. J. Konopinski  $\implies$  E. Greuling  $\implies$  P. F. Zweifel  $\implies$  one of us (C.E.S.)  $\implies$  one of us (R.D.M.G.).

Paul retired from Virginia Tech in 1996. In retirement, he continued his passions for opera, sports, bridge, travel, and his family. His last publishing efforts were to honor his colleague and friend Ken Case by preparing a biography of him that was posted on the website of the National Academy

of Sciences; an expanded version of the biographical memoir later was published in JCTT 43, 109–127 (2014); doi:[10.1080/00411450.2014.910229](https://doi.org/10.1080/00411450.2014.910229).

Paul started his career as a reactor physicist, but he evolved into a mathematical physicist who was equally comfortable with the theory and practical applications of particle and radiation transport. His scholarly contributions were numerous, with a heavy emphasis on reactor physics and neutron scattering, transport theory, and other mathematical physics problems including statistical physics. In addition, Paul published a surprising number of technical papers in other areas, especially in the theory of music. For TTSP, he summarized many of the physics conferences and ICTT meetings he attended and wrote reviews of technical books, as well as on more esoteric subjects. The breadth of his interests is best seen by scanning the variety of topics in each of the four research categories in the following list of his publications. He was truly a Renaissance man.

Paul died on 12 February 2017.

## Paul Zweifel's publications

### *Reactor physics and neutron scattering (1954–1976)*

- Jones, R. B., and P. F. Zweifel. 1976. Energy group structures and minimum critical mass. *Nucl. Sci. Eng.* 59 (4):429–436. doi:[10.13182/NSE76-A26843](https://doi.org/10.13182/NSE76-A26843).
- Edlund, M. C., R. B. Jones, and P. F. Zweifel. 1976. Multigroup representations of slowing-down kernels in H<sub>2</sub>O. *Nucl. Sci. Eng.* 59 (1):58–60. doi:[10.13182/NSE76-A26811](https://doi.org/10.13182/NSE76-A26811).
- Zweifel, P. F. 1973. *Reactor physics*. New York: McGraw-Hill.
- Jones, R. B., M. Tavel, and P. F. Zweifel. 1972. Comparison of neutron transport and diffusion theory from calculation of the minimum critical mass. *Trans. Amer. Nucl. Soc.* 15 (2):783–784.
- Karin, S., P. F. Zweifel, and R. B. Jones. 1970. Parameterization of spectrum-averaged thermal cross section. *Trans. Amer. Nucl. Soc.* 13 (1):306–306.
- Meyer, P. E., and P. F. Zweifel. 1970. Comparison of approximate resonance treatments for light-water-moderated systems. *Trans. Am. Nucl. Soc.* 13 (1):305–306.
- Kaplan, D. M., and P. F. Zweifel. 1969. Validity of the quasiclassical method in neutron scattering. *Phys. Rev.* 183 (1):310–312. doi:[10.1103/PhysRev.183.310](https://doi.org/10.1103/PhysRev.183.310).
- Mannan, M. A., and P. F. Zweifel. 1968. Interference between resonances in a slab lattice. *J. Nucl. Energy* 22 (3):139–152. doi:[10.1016/0022-3107\(68\)90024-5](https://doi.org/10.1016/0022-3107(68)90024-5).

- Summerfield, G. C., and P. F. Zweifel. 1968. Quasi-classical approximation for scattering from molecules. In *Neutron thermalization and reactor spectra*, vol. I, 283–291. Vienna: IAEA.
- Summerfield, G. C., and P. F. Zweifel. 1967. Application of the quasiclassical method to incoherent neutron scattering by molecules. *Phys. Rev.* 159 (1):1–2. doi:[10.1103/PhysRev.159.1](https://doi.org/10.1103/PhysRev.159.1).
- Zweifel, P. F., and M. A. Mannan. 1967. The cylindrical cell approximation in thermal utilization. *J. Nucl. Energy* 21 (1): 1–6. doi:[10.1016/0022-3107\(67\)90030-5](https://doi.org/10.1016/0022-3107(67)90030-5).
- Ferziger, J. H., and P. F. Zweifel. 1966. *The theory of neutron slowing down in nuclear reactors*. Cambridge: MIT Press and Oxford: Pergamon Press.
- Rosenbaum, M., and P. F. Zweifel. 1965. Quasiclassical theory of neutron scattering. *Phys. Rev.* 137 (2B):B271–B284. doi:[10.1103/PhysRev.137.B271](https://doi.org/10.1103/PhysRev.137.B271).
- Summerfield, G. C., and P. F. Zweifel. 1963. Slow neutron scattering, the “scattering law,” and  $G(\mathbf{r}, t)$ . *Phys. Rev.* 131 (3):1149–1152. doi:[10.1103/PhysRev.131.1149](https://doi.org/10.1103/PhysRev.131.1149).
- Ferziger, J. H., and P. F. Zweifel. 1963. Critical conditions in asymptotic reactor theory. *Trans. Am. Nucl. Soc.* 6 (2):274–274.
- Mannan, M. A., and P. F. Zweifel. 1963. Solution of diffusion equations in rectangular cells. *Trans. Am. Nucl. Soc.* 6 (1):4–4.
- Zweifel, P. F., and W. H. Buford Jr. 1962. Analysis of pulsed-neutron reactor startup. *Trans. Am. Nucl. Soc.* 5 (2):347–348.
- Mueller, R. E., R. B. Nicholson, and P. F. Zweifel. 1962. Localized source multiplication and reactor startup. *Trans. Am. Nucl. Soc.* 5 (1):67–67.
- Ball, G. L., R. B. Nicholson, and P. F. Zweifel. 1962. Scattering resonances and fast reactor calculations. *Trans. Am. Nucl. Soc.* 5 (1):54–54.
- Zweifel, P. F., and G. L. Ball. 1962. Group averaging of diffusion coefficients. *Nucl. Sci. Eng.* 12 (4):545–546. doi:[10.13182/NSE62-A26104](https://doi.org/10.13182/NSE62-A26104).
- Aamodt, R., K. M. Case, M. Rosenbaum, and P. F. Zweifel. 1962. Quasi-classical treatment of neutron scattering. *Phys. Rev.* 126 (3):1165–1167. doi:[10.1103/PhysRev.126.1165](https://doi.org/10.1103/PhysRev.126.1165).
- Rosenbaum, M., and P. F. Zweifel. 1962. Comparison of “classical” and “quasi-classical” cross sections for some simple systems. In *The Scattering Law*, BNL-719, 276–288. Vol. I of Proceedings of the Brookhaven Conference on Neutron Thermalization. Upton, NY: Brookhaven National Laboratory.
- Yip, S., and P. F. Zweifel. 1962. Errata. *Nucl. Sci. Eng.* 12 (4):556–556.
- Yip, S., and P. F. Zweifel. 1961. Escape-probabilities in asymptotic reactor theory. *Nucl. Sci. Eng.* 10 (4):362–366. doi:[10.13182/NSE61-A15379](https://doi.org/10.13182/NSE61-A15379).
- Zweifel, P. F., and J. H. Ferziger. 1961. Consistent  $P_1$  criticality calculations. *Nucl. Sci. Eng.* 10 (4):357–361. doi:[10.13182/NSE61-A15378](https://doi.org/10.13182/NSE61-A15378).

- Case, K. M., J. H. Ferziger, and P. F. Zweifel. 1961. Asymptotic reactor theory. *Nucl. Sci. Eng.* 10 (4):352–356. doi:[10.13182/NSE61-A15377](https://doi.org/10.13182/NSE61-A15377).
- Friedman, M. A., and P. F. Zweifel. 1961. Computer code abstract no. 14. *Nucl. Sci. Eng.* 10 (3):296–296. doi:[10.13182/NSE61-A25974](https://doi.org/10.13182/NSE61-A25974).
- Ferziger, J. H., G. S. C. Wang, and P. F. Zweifel. 1961. Diffusion lengths in heterogeneous media. *Nucl. Sci. Eng.* 10 (3):285–294. doi:[10.13182/NSE61-A25972](https://doi.org/10.13182/NSE61-A25972).
- Zweifel, P. F. 1961. Re: “An H<sub>2</sub>O-D<sub>2</sub>O moderated reactor”. *Nucl. Sci. Eng.* 9 (3):412–413. doi:[10.13182/NSE61-A25900](https://doi.org/10.13182/NSE61-A25900).
- Ferziger, J. H., G. S. C. Wang, and P. F. Zweifel. 1961. Diffusion parameters for heterogeneous systems. *Trans. Am. Nucl. Soc.* 4 (1):154–154.
- Stevens, C. A., and P. F. Zweifel. 1961. Multigroup diffusion equations with arbitrary space dependent coefficients. *Trans. Am. Nucl. Soc.* 4 (1):75–75.
- Nicholson, R. B., P. F. Zweifel, and J. H. Ferziger. 1961. The effect of fast reactor calculations of flux depression in scattering resonances. *Trans. Am. Nucl. Soc.* 4 (1):19–19.
- Zweifel, P. F., and J. M. Carpenter. 1961. Resolution of various devices for neutron spectroscopy. In *Inelastic scattering of neutrons in solids and liquids. Proceedings of a Symposium, Vienna, 11–14 October 1960*, 199–219. Vienna: IAEA.
- Holl, R. J., and P. F. Zweifel. 1960. Highly self shielded burnable poisons. *Trans. Am. Nucl. Soc.* 3 (2):493–494.
- Hayes, W. T., M. Luming, and P. F. Zweifel. 1960. Resonance escape, flux disadvantage, and collision probabilities. *Trans. Am. Nucl. Soc.* 3 (2):366–367.
- Klug, N. P., and P. F. Zweifel. 1960. An H<sub>2</sub>O-D<sub>2</sub>O moderated reactor. *Nucl. Sci. Eng.* 7 (6):541–544. doi:[10.13182/NSE60-A25763](https://doi.org/10.13182/NSE60-A25763).
- Mack, R. J., and P. F. Zweifel. 1960. Greuling-Goertzel calculations in heavy water. *Nucl. Sci. Eng.* 7 (2):144–146. doi:[10.13182/NSE60-A29083](https://doi.org/10.13182/NSE60-A29083).
- Levine, M. M., K. E. Roach, D. B. Wehmeyer, and P. F. Zweifel. 1960. The slowing down of neutrons by deuterium. *Nucl. Sci. Eng.* 7 (1):14–20. doi:[10.13182/NSE60-A25692](https://doi.org/10.13182/NSE60-A25692).
- Zweifel, P. F. 1960. Neutron self-shielding. *Nucleonics* 18 (11):174–175.
- Faber, M., and P. F. Zweifel. 1959. The age of U<sup>233</sup> fission neutrons in water. *Nucl. Sci. Eng.* 6 (1):81–81. doi:[10.13182/NSE59-A25633](https://doi.org/10.13182/NSE59-A25633).
- De Coulon, G., and P. F. Zweifel. 1959. Note on the thermal neutron spectrum in a diffusing medium. *Nucl. Sci. Eng.* 5 (3):203–204. doi:[10.13182/NSE59-A25582](https://doi.org/10.13182/NSE59-A25582).
- Krieger, T. J., and P. F. Zweifel. 1959. Theory of pulsed neutron experiments in multiplying media. *Nucl. Sci. Eng.* 5 (1):21–27. doi:[10.13182/NSE59-A27324](https://doi.org/10.13182/NSE59-A27324).

- Nims, J. B., and P. F. Zweifel. 1959. Sodium temperature coefficients in fast reactors. *Trans. Am. Nucl. Soc.* 2 (2):172–173.
- Purohit, S. N., and P. F. Zweifel. 1959. Thermal neutron energy spectrum in finite pulsed assembly. *Trans. Am. Nucl. Soc.* 2 (2):100–102.
- Stewart, J. C., and P. F. Zweifel. 1959. Self-shielding and Doppler effects in the absorption of neutrons. In *Physics and Mathematics*, ed. D. J. Hughes, J. E. Sanders, and J. Horowitz, 331–359. Vol. 3 of Progress in Nuclear Energy, Series I. New York: Pergamon.
- Krieger, T. J., P. F. Zweifel, and D. M. Keaveney. 1959. Calculation of Wigner-Wilkins spectra with  $M=18$  kernel and  $M=1$  source. In Proceedings of the Neutron Thermalization Conference, April 28–30, 1958, Gatlinburg, TN, ORNL-2739, Paper No. I-A. Oak Ridge, TN: Oak Ridge National Laboratory.
- Krieger, T. J., M. L. Storm, P. F. Zweifel, and D. M. Keaveney. 1959. The influence of non- $1/v$  absorbers on reactor parameters. In Proceedings of the Neutron Thermalization Conference, April 28–30, 1958, Gatlinburg, TN, ORNL-2739, Paper No. IV-B. Oak Ridge, TN: Oak Ridge National Laboratory.
- Stewart, J. C., and P. F. Zweifel. 1958. A review of self-shielding effects in the absorption of neutrons. In Proceedings of the Second UN International Conference on Peaceful Uses of Atomic Energy, Geneva, 1958, Vol. 16, 650–662. Geneva: United Nations.
- Goldstein, H., P. F. Zweifel, and D. G. Foster, Jr. 1958. The slowing down of neutrons in hydrogenous media – status of theory and experiment. In Proceedings of the Second U.N. International Conference on Peaceful Uses of Atomic Energy, Geneva, 1958, Vol. 16, 379–405. Geneva: United Nations.
- Krieger, T. J., and P. F. Zweifel. 1958. Theory of pulsed neutrons in multiplying assemblies. *Trans. Am. Nucl. Soc.* 1 (1):114–115.
- Petrie, C. D., M. L. Storm, and P. F. Zweifel. 1957. Calculation of thermal group constants for mixtures containing hydrogen. *Nucl. Sci. Eng.* 2 (6):728–744. doi:[10.13182/NSE57-A35488](https://doi.org/10.13182/NSE57-A35488).
- Francis, N. C., M. L. Storm, and P. F. Zweifel. 1957. Neutron age in diphenyl. *Nucl. Sci. Eng.* 2 (6):745–747. doi:[10.13182/NSE57-A35489](https://doi.org/10.13182/NSE57-A35489).
- Francis, N. C., H. Hurwitz Jr, and P. F. Zweifel. 1957. Criticality and flux calculations for hydrogenous assemblies. *Nucl. Sci. Eng.* 2 (3):253–287. doi:[10.13182/NSE57-A25395](https://doi.org/10.13182/NSE57-A25395).
- Hurwitz, H., Jr, and P. F. Zweifel. 1956. Self-shielding of lumped-poison mixtures. *Nucl. Sci. Eng.* 1 (5):438–440. doi:[10.13182/NSE56-A28780](https://doi.org/10.13182/NSE56-A28780).
- Francis, N. C., and P. F. Zweifel. 1956. A direct interaction model for inelastic scattering. *Physica* 22 (6–12):1163–1164. doi:[10.1016/S0031-8914\(56\)90149-5](https://doi.org/10.1016/S0031-8914(56)90149-5).

- Wilkins, J. E., Jr, R. L. Hellens, and P. F. Zweifel. 1956. Status of experimental and theoretical information on neutron slowing-down distributions in hydrogenous media. In Proceedings U.N. International Conference on the Peaceful Uses of Atomic Energy, Geneva, 1955, Vol. 5, 62–76. New York: United Nations.
- Hurwitz, H., Jr, and P. F. Zweifel. 1955. Slowing down of neutrons by hydrogenous moderators. *J. Appl. Phys.* 26 (8):923–931. doi:[10.1063/1.1722139](https://doi.org/10.1063/1.1722139).
- Zweifel, P. F., and H. Hurwitz, Jr. 1954. Transformation of scattering cross sections. *J. Appl. Phys.* 25 (10):1241–1245. doi:[10.1063/1.1721536](https://doi.org/10.1063/1.1721536).
- Zweifel, P. F., and H. Hurwitz, Jr. 1954. Slowing down of neutrons in hydrogenous moderators. *Phys. Rev.* 95 (2):660–660.

### **Linear transport theory (1962–2012)**

- Zweifel, P. F. 2012. Kenneth Case and his singular “eigenfunctions”. *TTSP* 41 (5–6):406–417. doi:[10.1080/00411450.2012.671225](https://doi.org/10.1080/00411450.2012.671225).
- Zweifel, P. F. 1999. The canonical inverse problem. *TTSP* 28 (2):171–179. doi:[10.1080/00411459908205655](https://doi.org/10.1080/00411459908205655).
- Zweifel, P. F., and G. Lauro. 1997. Some comments on Case eigenfunctions. *TTSP* 26 (6):727–735. doi:[10.1080/00411459708229332](https://doi.org/10.1080/00411459708229332).
- Zweifel, P. F. 1997. Transport theory revisited – 1960–1995 (a case history). *TTSP* 26 (1–2):181–193. doi:[10.1080/00411459708221782](https://doi.org/10.1080/00411459708221782).
- Paveri-Fontana, S. L., and P. F. Zweifel. 1995. A transport equation for relativistic particles. *TTSP* 24 (1–3):31–40. doi:[10.1080/00411459508205118](https://doi.org/10.1080/00411459508205118).
- Rondoni, L., and P. F. Zweifel. 1993. Singular integral equations on closed contours–II. *TTSP* 22 (5):723–731. doi:[10.1080/00411459308203839](https://doi.org/10.1080/00411459308203839).
- Rondoni, L., P. F. Zweifel, and H. Frisch. 1993. Singular integral equations on the interval. *TTSP* 22 (4):549–560. doi:[10.1080/00411459308203828](https://doi.org/10.1080/00411459308203828).
- Frisch, H., C. V. M. van der Mee, and P. F. Zweifel. 1991. Corrections to “Distributional solutions of singular integral equations”. *J. Int. Eqs. Appl.* 3 (3):467–467.
- Zweifel, P. F. 1990. Singular integral equations on closed contours. *TTSP* 19 (2):161–177. doi:[10.1080/00411459008214509](https://doi.org/10.1080/00411459008214509).
- Frisch, H., C. V. M. van der Mee, and P. F. Zweifel. 1990. Distributional solutions of singular integral equations. *J. Int. Eqs. Appl.* 2 (2):205–210. doi:[10.1216/JIE-1990-2-2-205](https://doi.org/10.1216/JIE-1990-2-2-205).
- van der Mee, C. V. M., and P. F. Zweifel. 1990. Application of orthogonality relations to singular integral equations. *J. Int. Eqs. Appl.* 2 (2):185–204. doi:[10.1216/JIE-1990-2-2-185](https://doi.org/10.1216/JIE-1990-2-2-185).
- Frisch, H., G. C. Pomraning, and P. F. Zweifel. 1990. An exact analytical solution of a radiative transfer problem in a binary mixture. *J. Quant.*

- Spectrosc. Rad. Transfer* 43 (4):271–284. doi:[10.1016/0022-4073\(90\)90017-Z](https://doi.org/10.1016/0022-4073(90)90017-Z).
- Zweifel, P.F. 1989. Singular eigenfunctions and invariant imbedding. In Principle of invariance and its applications. Proceedings of the International Symposium devoted to the 40th anniversary of the Principle of Invariance Introduction to the Radiation Transfer Theory, Byurakan, Armenia, October 26–30, 1981, ed. M. A. Mnatsakanian, and H. V. Pikichian, 306–314. Yerevan: Academy of Sciences of Armenian SSR.
- Zweifel, P. F. and C. V. M. van der Mee. 1988. Singular integral equations on closed contours. *Rendiconti del Seminario Matematico e Fisico di Milano* 58 (1):195–206. doi:[10.1007/BF02925241](https://doi.org/10.1007/BF02925241).
- Slawny, J., and P. F. Zweifel. 1988. A note on the singular eigenfunction method in transport theory. *TTSP* 17 (2–3):283–294. doi:[10.1080/00411458808230868](https://doi.org/10.1080/00411458808230868).
- Paveri-Fontana, S. L., and P. F. Zweifel. 1987. Application of the closure relation in transport theory. *TTSP* 16 (8):1095–1127. doi:[10.1080/00411458708204609](https://doi.org/10.1080/00411458708204609).
- Willis, B. L., P. F. Zweifel, and C. V. M. van der Mee. 1985. Whither existence theory? *TTSP* 14 (5):669–678. doi:[10.1080/00411458508211698](https://doi.org/10.1080/00411458508211698).
- Greenberg, W., C. V. M. van der Mee, and P. F. Zweifel. 1984. Generalized kinetic equations. *Integr. Equ. Oper. Theory* 7 (1):60–95. doi:[10.1007/BF01204914](https://doi.org/10.1007/BF01204914).
- Zweifel, P. F. 1984. The Boltzmann equation and its properties. In *Kinetic theories and the Boltzmann equation* (Montecatini, June 10–18, 1981), ed. C. Cercignani, 111–175. Vol. 1048 of Lecture Notes in Mathematics. Berlin: Springer. doi:[10.1007/BFb0071879](https://doi.org/10.1007/BFb0071879).
- Zweifel, P. F. 1984. Completeness theorems in transport theory. *TTSP* 13 (1–2):57–67. doi:[10.1080/00411458408211652](https://doi.org/10.1080/00411458408211652).
- Greenberg, W., J. Polewczak, and P. F. Zweifel. 1983. Global existence proofs for the Boltzmann equation. In *Nonequilibrium phenomena I*, ed. J. L. Lebowitz, and E. W. Montroll, 19–49. Vol. X of Studies in Statistical Mechanics. Amsterdam: North-Holland.
- Zweifel, P. F. 1982. A generalized transport equation. *TTSP* 11 (3–4):183–198. doi:[10.1080/00411458208245740](https://doi.org/10.1080/00411458208245740).
- Zweifel, P. F., and W. Greenberg. 1982. Resolvent integration methods in transport theory. In *Toeplitz centennial* (Tel Aviv, May 11–15, 1981), ed. I. Gohberg, 525–539. Vol. 4 of Operator Theory: Advanced Applications. Basel: Birkhäuser. doi:[10.1007/978-3-0348-5183-1\\_30](https://doi.org/10.1007/978-3-0348-5183-1_30).
- Bowden, R. L., W. Greenberg, and P. F. Zweifel. 1979. Resolvent integration techniques for generalized transport equations. *J. Math. Phys.* 20 (6):1099–1108. doi:[10.1063/1.524160](https://doi.org/10.1063/1.524160).



- Greenberg, W., J. Voigt, and P. F. Zweifel. 1979. Discretized Boltzmann equation: lattice limit and non-Maxwellian gases. *J. Stat. Phys.* 21 (6):649–657. doi:[10.1007/BF01107907](https://doi.org/10.1007/BF01107907).
- Cercignani, C., W. Greenberg, and P. F. Zweifel. 1979. Global solutions of the Boltzmann equation on a lattice. *J. Stat. Phys.* 20 (4):449–462. doi:[10.1007/BF01011781](https://doi.org/10.1007/BF01011781).
- Greenberg, W., J. Voigt, and P. F. Zweifel. 1979. Convergence of a lattice model of the Boltzmann equation. *Lett. Math. Phys.* 3 (4):293–296. doi:[10.1007/BF01821849](https://doi.org/10.1007/BF01821849).
- Garbanati, L. F., W. Greenberg, and P. F. Zweifel. 1978. Uniqueness of solutions to the linearized Boltzmann equation. *J. Math. Phys.* 19 (1):249–252. doi:[10.1063/1.523545](https://doi.org/10.1063/1.523545).
- Zweifel, P. F. 1978. Twenty years of transport theory. *TTSP* 7 (4):173–190. doi:[10.1080/00411457808204626](https://doi.org/10.1080/00411457808204626).
- Baird, L. C., S. Sancaktar, and P. F. Zweifel. 1977. The Poincaré-Bertrand formula: A derivation and a generalization. *SIAM J. Math. Anal.* 8 (4):580–591. doi:[10.1137/0508046](https://doi.org/10.1137/0508046).
- Bowden, R. L., W. L. Cameron, and P. F. Zweifel. 1977. Conservative neutron transport theory. *J. Math. Phys.* 18 (2):281–284. doi:[10.1063/1.523247](https://doi.org/10.1063/1.523247).
- Bowden, R. L., W. Greenberg, and P. F. Zweifel. 1977. Critical multigroup transport. *SIAM J. Appl. Math.* 32 (4):765–777. doi:[10.1137/0132064](https://doi.org/10.1137/0132064).
- Bowden, R. L., S. Sancaktar, and P. F. Zweifel. 1976. Multigroup neutron-transport. II. Half range. *J. Math. Phys.* 17 (1):82–86. doi:[10.1063/1.522801](https://doi.org/10.1063/1.522801).
- Bowden, R. L., S. Sancaktar, and P. F. Zweifel. 1976. Multigroup neutron transport. I. Full range. *J. Math. Phys.* 17 (1):76–81. doi:[10.1063/1.522788](https://doi.org/10.1063/1.522788).
- Larsen, E. W., and P. F. Zweifel. 1976. Explicit matrix Wiener-Hopf factorizations. *SIAM J. Appl. Math.* 30 (4):732–738. doi:[10.1137/0130066](https://doi.org/10.1137/0130066).
- Greenberg, W., and P. F. Zweifel. 1976. Functional analytic treatment of the transport equation. *TTSP* 5 (4):219–253. doi:[10.1080/00411457608230831](https://doi.org/10.1080/00411457608230831).
- Bowden, R. L., and P. F. Zweifel. 1976. A Banach space analysis of the Chandrasekhar  $H$ -equation. *Astrophys. J.* 210 (1):178–183. doi:[10.1086/154816](https://doi.org/10.1086/154816).
- Larsen, E. W., and P. F. Zweifel. 1976. Steady, one-dimensional multigroup neutron transport with anisotropic scattering. *J. Math. Phys.* 17 (10):1812–1820. doi:[10.1063/1.522826](https://doi.org/10.1063/1.522826).
- Bowden, R. L., P. F. Zweifel, and R. Menikoff. 1976. On the solution of nonlinear matrix integral equations in transport theory. *J. Math. Phys.* 17 (9):1722–1726. doi:[10.1063/1.523100](https://doi.org/10.1063/1.523100).

- Greenberg, W., and P. F. Zweifel. 1976. The Case eigenfunction expansion for a conservative medium. *J. Math. Phys.* 17 (2):163–167. doi:[10.1063/1.522872](https://doi.org/10.1063/1.522872).
- Zweifel, P. F. 1975. Recent developments in transport theory. *Rendiconti del Seminario Matematico e Fisico di Milano* 45 (1):71–96. doi:[10.1007/BF02925600](https://doi.org/10.1007/BF02925600).
- Zweifel, P. F. 1975. Another collection of problems in transport theory. *TTSP* 4 (3):135–141. doi:[10.1080/00411457508214536](https://doi.org/10.1080/00411457508214536).
- Larsen, E. W., S. Sancaktar, and P. F. Zweifel. 1975. Extension of the Case formulas to  $L_p$ . Application to half and full space problems. *J. Math. Phys.* 16 (5):1117–1121. doi:[10.1063/1.522641](https://doi.org/10.1063/1.522641).
- Larsen, E. W., and P. F. Zweifel. 1974. On the spectrum of the linear transport operator. *J. Math. Phys.* 15 (11):1987–1997. doi:[10.1063/1.1666570](https://doi.org/10.1063/1.1666570).
- Baird, L. C., and P. F. Zweifel. 1974. A simplified derivation of the Poincaré-Bertrand formula. *Nucl. Sci. Eng.* 55 (3):351–353. doi:[10.13182/NSE74-A23463](https://doi.org/10.13182/NSE74-A23463).
- Baird, L. C., and P. F. Zweifel. 1974. Generalized spectral decomposition, with application to the reduced transport operator. *Nuovo Cimento B* 23 (2):402–416. doi:[10.1007/BF02723647](https://doi.org/10.1007/BF02723647).
- Baird, L. C., and P. F. Zweifel. 1972. Spectral analysis of the reduced transport operator. *Notices Am. Math. Soc.* 19 (2):A363–A363.
- Silvennoinen, P., and P. F. Zweifel. 1972. On multigroup transport theory with a degenerate transfer kernel. *J. Math. Phys.* 13 (8):1114–1117. doi:[10.1063/1.1666105](https://doi.org/10.1063/1.1666105).
- Burniston, E. E., C. E. Siewert, P. Silvennoinen, and P. F. Zweifel. 1972. Corrigendum: Matrix Riemann-Hilbert problems related to neutron transport theory. *Nucl. Sci. Eng.* 47 (1):167–167. doi:[10.13182/NSE72-A28440](https://doi.org/10.13182/NSE72-A28440).
- Silvennoinen, P., and P. F. Zweifel. 1971. Multigroup transport equation with a separable kernel. *J. Quant. Spectrosc. Rad. Transfer* 11 (6):869–877. doi:[10.1016/0022-4073\(71\)90061-6](https://doi.org/10.1016/0022-4073(71)90061-6).
- Silvennoinen, P., and P. F. Zweifel. 1971. Two-group transport equation with a separable kernel. *TTSP* 1 (3):239–260. doi:[10.1080/00411457108231449](https://doi.org/10.1080/00411457108231449).
- Burniston, E. E., C. E. Siewert, P. Silvennoinen, and P. F. Zweifel. 1971. Matrix Riemann-Hilbert problems related to neutron transport theory. *Nucl. Sci. Eng.* 45 (3):331–332. doi:[10.13182/NSE71-A19085](https://doi.org/10.13182/NSE71-A19085).
- Silvennoinen, P., and P. F. Zweifel. 1970. On the discrete spectrum of the transport operator. *Nucl. Sci. Eng.* 42 (1):103–104. doi:[10.13182/NSE70-A19335](https://doi.org/10.13182/NSE70-A19335).
- Pahor, S., and P. F. Zweifel. 1969. Invariant imbedding and Case eigenfunctions. *J. Math. Phys.* 10 (4):581–589. doi:[10.1063/1.1664880](https://doi.org/10.1063/1.1664880).
- Pahor, S., and P. F. Zweifel. 1968. Invariant imbedding and Case eigenfunctions. *Bull. Am. Phys. Soc. Series II* 13 (6):899–899.

- Nicolaenko, B., and P. F. Zweifel. 1968. Energy-dependent Boltzmann equation with fission and slowing-down kernels. In *Neutron thermalization and reactor spectra*, Vol. I, 63–80. Vienna: IAEA.
- Metcalf, D. R., and P. F. Zweifel. 1968. Solution of the two-group neutron transport equation—II. *Nucl. Sci. Eng.* 33 (3):318–326. doi:[10.13182/NSE68-A19240](https://doi.org/10.13182/NSE68-A19240).
- Metcalf, D. R., and P. F. Zweifel. 1968. Solution of the two-group neutron transport equation—I. *Nucl. Sci. Eng.* 33 (3):307–317. doi:[10.13182/NSE68-A19239](https://doi.org/10.13182/NSE68-A19239).
- Usseli, A. I., and P. F. Zweifel. 1968. On the connection between absorption and the anisotropy of scattering in neutron transport theory. *Nucl. Sci. Eng.* 31 (1):173–173. doi:[10.13182/NSE68-A18030](https://doi.org/10.13182/NSE68-A18030).
- Zweifel, P. F. 1967. Neutron transport theory. In *Developments in transport theory: A NATO Advanced Study Institute on Transport Theory held at Ankara, Turkey*, ed. E. İnönü, and P. F. Zweifel, 73–111. London: Academic.
- İnönü, E., and P. F. Zweifel eds. 1967. *Developments in transport theory: A NATO Advanced Study Institute on Transport Theory held at Ankara, Turkey*. London: Academic.
- Zweifel, P. F. 1967. Comments on “Anisotropic scattering coefficients in the constant cross-section transport equation”. *Nucl. Sci. Eng.* 28 (3):466–466. doi:[10.13182/NSE67-A28969](https://doi.org/10.13182/NSE67-A28969).
- Case, K. M., and P. F. Zweifel. 1967. *Linear transport theory*. Reading, MA: Addison-Wesley.
- Siewert, C. E., and P. F. Zweifel. 1966. An exact solution of equations of radiative transfer for local thermodynamic equilibrium in the non-gray case. Picket fence approximation. *Ann. Phys.* 36 (1):61–85. doi:[10.1016/0003-4916\(66\)90290-9](https://doi.org/10.1016/0003-4916(66)90290-9).
- Siewert, C. E., and P. F. Zweifel. 1966. Generalized picket-fence model for radiative transfer. *Bull. Am. Phys. Soc. Series II* 11 (1):114–114.
- Siewert, C. E., and P. F. Zweifel. 1966. Radiative transfer II. *J. Math. Phys.* 7 (11):2092–2102. doi:[10.1063/1.1704894](https://doi.org/10.1063/1.1704894).
- Kuščer, I., and P. F. Zweifel. 1965. Time-dependent one-speed albedo problem for a semi-infinite medium. *J. Math. Phys.* 6 (7):1125–1130. doi:[10.1063/1.1704379](https://doi.org/10.1063/1.1704379).
- Siewert, C. E., and P. F. Zweifel. 1965. An exact solution of the equations of radiative transfer. *Trans. Amer. Nucl. Soc.* 8 (2):504–504.
- Kuščer, I., and P. F. Zweifel. 1964. Time-dependent one-velocity albedo problem for a semi-infinite medium. *Trans. Am. Nucl. Soc.* 7 (1):14–14.
- Zweifel, P. F., and S. B. Garg. 1964. Anisotropic scattering in the  $S_N$  method. *Nucl. Sci. Eng.* 20 (4):513–516. doi:[10.13182/NSE64-A20993](https://doi.org/10.13182/NSE64-A20993).

- Zweifel, P. F. 1964. Recent applications of neutron transport theory. Michigan Memorial Phoenix Project, University of Michigan report MMPP-FRPC-64-1.
- Case, K. M., and P. F. Zweifel. 1963. Existence and uniqueness theorems for the neutron transport equation. *J. Math. Phys.* 4 (11):1376–1385. doi:10.1063/1.1703916.
- Summerfield, G. C., and P. F. Zweifel. 1963. On the energy-dependent transport equation. *Nucl. Sci. Eng.* 15 (4):476–477. doi:10.13182/NSE63-A26466.
- Mendelson, M. R., and P. F. Zweifel. 1962. Relations among angular flux from various sources. *Trans. Am. Nucl. Soc.* 5 (2):349–350.

### **Other mathematical physics (1954–2003)**

- Borgioli, G., G. Frosali, and P. F. Zweifel. 2003. Wigner approach to the two-band Kane model for a tunneling diode. *TTSP* 32 (3–4):347–366. doi:10.1081/TT-120024768.
- Barletti, L., and P. F. Zweifel. 2001. Parity-decomposition method for the stationary Wigner equation with inflow boundary conditions. *TTSP* 30 (4–6):507–520. doi:10.1081/TT-100105935.
- Arnold, A., H. Lange, and P. F. Zweifel. 2000. A discrete-velocity, stationary Wigner equation. *J. Math. Phys.* 41 (11):7167–7180. doi:10.1063/1.1318732.
- Lange, H., B. Toomire, and P. F. Zweifel. 1999. Inflow boundary conditions in quantum transport theory. *VLSI Design* 9 (4):385–396. doi:10.1155/1999/84905.
- Zweifel, P. F., and B. Toomire. 1998. Quantum transport theory. *TTSP* 27 (3–4):347–359. doi:10.1080/00411459808205630.
- Illner, R., H. Lange, B. Toomire, and P. Zweifel. 1997. On quasi-linear Schrödinger-Poisson systems. *Math. Methods Appl. Sci.* 20 (14):1223–1238. doi:10.1002/(SICI)1099-1476(19970925)20:14 < 1223::AID-MMA911 > 3.0.CO;2-O.
- Zweifel, P. F., and B. Toomire. 1997. Boundary conditions in quantum transport theory. *TTSP* 26 (4–5):629–636. doi:10.1080/00411459708017934.
- Lange, H., and P. F. Zweifel. 1997. Mixed boundary-value problems for the two-dimensional Schrödinger-Poisson system. *Rep. Math. Phys.* 39 (3):283–297. doi:10.1016/S0034-4877(97)89749-2.
- Lange, H., B. Toomire, and P. F. Zweifel. 1996. The Schrödinger-Poisson eigenmatrix problem. *J. Math. Anal. Appl.* 203 (2):289–302. doi:10.1006/jmaa.1996.0381.

- Lange, H., and P. F. Zweifel. 1996. Periodic solutions to the Wigner-Poisson equation. *Nonlinear Analysis* 26 (3):551–563. doi:10.1016/0362-546X(94)00298-V.
- Lange, H., B. Toomire, and P. F. Zweifel. 1996. Quantum BGK modes for the Wigner-Poisson system. *TTSP* 25 (6):713–722. doi:10.1080/00411459608222920.
- Bohun, S., R. Illner, H. Lange, and P. F. Zweifel. 1996. Error estimates for Galerkin approximations to the periodic Schrödinger-Poisson system. *Zeitschrift für Angewandte Mathematik und Mechanik* 76 (1):7–13. doi:10.1002/zamm.19960760103.
- Lange, H., B. Toomire, and P. F. Zweifel. 1995. Time-dependent dissipation in nonlinear Schrödinger systems. *J. Math. Phys.* 36 (3):1274–1283. doi:10.1063/1.531120.
- Lange, H., B. Toomire, and P. F. Zweifel. 1995. An overview of Schrödinger-Poisson problems. *Rep. Math. Phys.* 36 (2–3):331–345. doi:10.1016/0034-4877(96)83629-9.
- Illner, R., P. F. Zweifel, and H. Lange. 1994. Global existence, uniqueness and asymptotic behavior of solutions of the Wigner-Poisson and Schrödinger-Poisson systems. *Math. Methods Appl. Sci.* 17 (5):349–376. doi:10.1002/mma.1670170504.
- Lange, H., and P. F. Zweifel. 1994. Dissipation in Wigner-Poisson systems. *J. Math. Phys.* 35 (4):1513–1521. doi:10.1063/1.530887.
- Kavian, O., H. Lange, and P. F. Zweifel. 1994. Periodic and stationary solutions to the Schrödinger-Poisson and Wigner-Poisson systems. *Zeitschrift für Angewandte Mathematik und Mechanik* 74 (6):T606–T608.
- Lange, H., B. V. Toomire, and P. F. Zweifel. 1994. A survey of Wigner-Poisson problems. In *Mathematical results in quantum mechanics* (Blossin, May 17–21, 1993), ed. M. Demuth, P. Exner, H. Neidhardt, and V. Zagrebnov, 239–256. Vol. 70 of *Operator Theory: Advanced Applications*. Basel: Birkhäuser. doi:10.1007/978-3-0348-8545-4\_30.
- Paveri-Fontana, S. L., and P. F. Zweifel. 1994. Erratum: The half-Hartley and half-Hilbert transforms. [J. Math. Phys. 35, 2648 (1994)]. *J. Math. Phys.* 35 (11):6226–6226. doi:10.1063/1.530670.
- Paveri-Fontana, S. L., and P. F. Zweifel. 1994. The half-Hartley and the half-Hilbert transform. *J. Math. Phys.* 35 (5):2648–2656. doi:10.1063/1.530529.
- Lange, H., B. Toomire, and P. F. Zweifel. 1994. A note on conservation laws. *TTSP* 23 (5):731–736. doi:10.1080/00411459408204349.
- Rondoni, L., and P. F. Zweifel. 1993. Solutions of singular integral equations from gas dynamics and plasma physics. *J. Stat. Phys.* 70 (5–6):1297–1312. doi:10.1007/BF01049433.
- Zweifel, P. F. 1993. The Wigner transform and the Wigner-Poisson system. *TTSP* 22 (4):459–484. doi:10.1080/00411459308203824.

- Zweifel, P. F. 1993. The Poisson-Wigner system: a quantum transport equation. *Rep. Math. Phys.* 33 (1-2):317-323. doi:[10.1016/0034-4877\(93\)90066-N](https://doi.org/10.1016/0034-4877(93)90066-N).
- Greenberg, W., P. F. Zweifel, and S. Pavari-Fontana. 1992. Erratum: "The Riemann-Hilbert problem for nonsymmetric systems" [*J. Math. Phys.* 32, 3540 (1991)]. *J. Math. Phys.* 33 (4):1566-1566. doi:[10.1063/1.529982](https://doi.org/10.1063/1.529982).
- Demeio, L., and P. F. Zweifel. 1991. Reply to the comments of Bertrand et al. *Phys. Fluids B: Plasma Phys.* 3 (2):501-501. doi:[10.1063/1.859898](https://doi.org/10.1063/1.859898).
- Greenberg, W., P. F. Zweifel, and S. Pavari-Fontana. 1991. The Riemann-Hilbert problem for nonsymmetric systems. *J. Math. Phys.* 32 (12):3540-3545. doi:[10.1063/1.529415](https://doi.org/10.1063/1.529415).
- Bohun, C. S., R. Illner, and P. F. Zweifel. 1991. Some remarks on the Wigner transform and the Wigner-Poisson system. *Le Matematiche* 46 (1):429-438.
- Rondoni, L., and P. F. Zweifel. 1991. Collided-flux-expansion method for the transport of muonic deuterium in finite media. *Phys. Rev. A* 44 (2):1104-1109. doi:[10.1103/PhysRevA.44.1104](https://doi.org/10.1103/PhysRevA.44.1104).
- Demeio, L., and P. F. Zweifel. 1990. Numerical simulations of perturbed Vlasov equilibria. *Phys. Fluids B: Plasma Phys.* 2 (6):1252-1255. doi:[10.1063/1.859265](https://doi.org/10.1063/1.859265).
- Pavari-Fontana, S. L., C. V. M. van der Mee, and P. F. Zweifel. 1989. A neutral gas model for electron swarms. *J. Stat. Phys.* 57 (1-2):247-265. doi:[10.1007/BF01023642](https://doi.org/10.1007/BF01023642).
- Rusjan, E., and P. F. Zweifel. 1988. Diffusion of muonic atoms. *Phys. Rev. A* 38 (8):4162-4167. doi:[10.1103/PhysRevA.38.4162](https://doi.org/10.1103/PhysRevA.38.4162).
- Rusjan, E., and P. F. Zweifel. 1988. Scattering kernels for the muon diffusion equation. *Phys. Rev. A* 38 (4):1860-1865. doi:[10.1103/PhysRevA.38.1860](https://doi.org/10.1103/PhysRevA.38.1860).
- Gallavotti, G., and P. F. Zweifel, eds. 1988. *Nonlinear evolution and chaotic phenomena*. New York: Plenum Press.
- Burnap, C., and P. F. Zweifel. 1987. Cauchy problems involving non-selfadjoint operators. *Applicable Analysis* 25 (4):301-318. doi:[10.1080/00036818708839694](https://doi.org/10.1080/00036818708839694).
- van der Mee, C. V. M., and P. F. Zweifel. 1987. A Fokker-Planck equation for growing cell populations. *J. Math. Biol.* 25 (1):61-72. doi:[10.1007/BF00275888](https://doi.org/10.1007/BF00275888).
- Burnap, C., and P. F. Zweifel. 1986. A note on the spectral theorem. *Integr. Equ. Oper. Theory* 9 (3):305-324. doi:[10.1007/BF01199348](https://doi.org/10.1007/BF01199348).
- Willis, B. L., and P. F. Zweifel. 1985. Normal and antinormal ordering of boson operator functions. *Phys. Lett. A* 108 (7):322-324. doi:[10.1016/0375-9601\(85\)90105-7](https://doi.org/10.1016/0375-9601(85)90105-7).
- Van der Hoek, J., and P. F. Zweifel. 1985. The maximal chain model - A one-dimensional system with a first-order phase transition.

- In *Applications of field theory to statistical mechanics* (Sitges, June 10–15, 1984), ed. L. Garrido, 276–279. Berlin: Springer-Verlag.
- Burnap, C., M. Miklavčič, B. L. Willis, and P. F. Zweifel. 1985. Single-mode saturation of a linearly unstable plasma. *Phys. Fluids* 28 (1):110–115. doi:[10.1063/1.865190](https://doi.org/10.1063/1.865190).
- Zweifel, P. F., C. Burnap, M. Miklavčič, and B. L. Willis. 1985. Linear and nonlinear plasma oscillations. *Nuovo Cimento A* 87 (2):162–173. doi:[10.1007/BF02902342](https://doi.org/10.1007/BF02902342).
- Zweifel, P. F., C. Burnap, M. Miklavčič, and B. L. Willis. 1985. Non-linear plasma oscillations. In *Proceedings of the Workshop on Mathematical Aspects of Fluid and Plasma Dynamics* (Trieste, May 30–June 2, 1984), ed. C. Cercignani, S. Rionero, and M. Tessarotto, 573–588. Università degli Studi di Trieste, Facoltà di Scienze, Istituto di Meccanica.
- Larsen, E. W., C. Burnap, and P. F. Zweifel. 1983. On the order of the linear instability of a plasma. *TTSP* 12 (1):73–79. doi:[10.1080/00411458308212732](https://doi.org/10.1080/00411458308212732).
- Brysk, H., J. Slawny, and P. F. Zweifel. 1983. The law of radioactive decay II. *Nuovo Cimento B* 73 (2):213–225. doi:[10.1007/BF02721790](https://doi.org/10.1007/BF02721790).
- Spiga, G., B. L. Willis, and P. F. Zweifel. 1981. Vlasov-Fokker-Planck description of plasma stability. *TTSP* 10 (4):149–160. doi:[10.1080/00411458108247968](https://doi.org/10.1080/00411458108247968).
- Arthur, M. D., H. Brysk, S. L. Pavari-Fontana, and P. F. Zweifel. 1981. The law of radioactive decay. *Nuovo Cimento B* 63 (2):565–587. doi:[10.1007/BF02755099](https://doi.org/10.1007/BF02755099).
- Brysk, H., and P. F. Zweifel. 1981. Possible bound states of repulsive potentials. *Phys. Rev. C* 23 (3):968–972. doi:[10.1103/PhysRevC.23.968](https://doi.org/10.1103/PhysRevC.23.968).
- Pavari-Fontana, S., B. L. Willis, and P. F. Zweifel. 1981. Spectrum of a Vlasov-Fokker-Planck operator-II. *TTSP* 10 (4):137–147. doi:[10.1080/00411458108247967](https://doi.org/10.1080/00411458108247967).
- Zweifel, P. F., and J. Ohlmann. 1981. Spectrum of a Vlasov-Fokker-Planck operator. *Prog. Nucl. Energy* 8 (2–3):145–150. doi:[10.1016/0149-1970\(81\)90008-1](https://doi.org/10.1016/0149-1970(81)90008-1).
- Burnap, C., H. Brysk, and P. F. Zweifel. 1981. Dirac Hamiltonian for strong Coulomb fields. *Nuovo Cimento B* 64 (2):407–419. doi:[10.1007/BF02903299](https://doi.org/10.1007/BF02903299).
- Arthur, M. D., and P. F. Zweifel. 1980. Anisotropic plasma boundary value problem for longitudinal waves. *Ann. Nucl. Energy* 7 (4–5):219–225. doi:[10.1016/0306-4549\(80\)90068-7](https://doi.org/10.1016/0306-4549(80)90068-7).
- Arthur, M. D., J. Voigt, and P. F. Zweifel. 1979. An existence and uniqueness theorem for the Vlasov-Maxwell equations. *TTSP* 8 (1):23–28. doi:[10.1080/00411457908204332](https://doi.org/10.1080/00411457908204332).

- Arthur, M. D., R. L. Bowden, and P. F. Zweifel. 1979. Analysis of the dispersion function for anisotropic longitudinal plasma waves. *J. Math. Phys.* 20 (10):2126–2130. doi:[10.1063/1.523982](https://doi.org/10.1063/1.523982).
- Nonnenmacher, T. F., and P. F. Zweifel. 1979. A Boltzmann equation for phonons and electrons. *Physica Status Solidi (B)* 96 (2):653–658. doi:[10.1002/pssb.2220960220](https://doi.org/10.1002/pssb.2220960220).
- Arthur, M. D., W. Greenberg, and P. F. Zweifel. 1979. Transverse plasma oscillations. *Phys. Fluids* 22 (8):1465–1470. doi:[10.1063/1.862768](https://doi.org/10.1063/1.862768).
- Burnap, C., W. Greenberg, and P. F. Zweifel. 1979. Eigenvalue problem for singular potentials. *Nuovo Cimento A* 50 (4):457–465. doi:[10.1007/BF02902552](https://doi.org/10.1007/BF02902552).
- Arthur, M. D., W. Greenberg, and P. F. Zweifel. 1978. Kinetic theory of plasma stability. In *Recent Advances in Engineering Science: Proceedings of the Fifteenth Annual Meeting Society of Engineering Science*, 4–6 December 1978, ed. R. L. Sierakowski, 135–138. Gainesville: University of Florida.
- Arthur, M. D., W. Greenberg, and P. F. Zweifel. 1977. Vlasov theory of plasma oscillations: Linear approximation. *Phys. Fluids* 20 (8):1296–1301. doi:[10.1063/1.862000](https://doi.org/10.1063/1.862000).
- Zweifel, P. F., R. L. Bowden, and R. Menikoff. 1977. Bilinear integral equations in Banach space. In *Dynamical Systems, Proceedings of a University of Florida International Symposium*, ed. A. R. Bednarek, and L. Cesari, 513–516. New York: Academic Press. doi:[10.1016/B978-0-12-083750-2.50060-6](https://doi.org/10.1016/B978-0-12-083750-2.50060-6).
- Zweifel, P. F. 1974. Measurement in quantum mechanics, and the EPR paradox. *Int. J. Theor. Phys.* 10 (1):67–72. doi:[10.1007/BF01808317](https://doi.org/10.1007/BF01808317).
- Summerfield, G. C., and P. F. Zweifel. 1969. Relationships among generalized phase-space distributions. *J. Math. Phys.* 10 (2):233–235. doi:[10.1063/1.1664837](https://doi.org/10.1063/1.1664837).
- Plummer, J. P., G. C. Summerfield, and P. F. Zweifel. 1967. Quantum statistics and slow neutron scattering by gases. *J. Chem. Phys.* 47 (12):4923–4929. doi:[10.1063/1.1701741](https://doi.org/10.1063/1.1701741).
- İmre, K., E. Özizmir, M. Rosenbaum, and P. F. Zweifel. 1967. Wigner method in quantum statistical mechanics. *J. Math. Phys.* 8 (5):1097–1108. doi:[10.1063/1.1705323](https://doi.org/10.1063/1.1705323).
- Zweifel, P. F. 1957. Allowed capture-positron branching ratios. *Phys. Rev.* 107 (1):329–330. doi:[10.1103/PhysRev.107.329](https://doi.org/10.1103/PhysRev.107.329).
- Zweifel, P. F. 1955. Erratum: Capture-positron branching ratios. *Phys. Rev.* 98 (6):1870–1870. doi:[10.1103/PhysRev.98.1870.3](https://doi.org/10.1103/PhysRev.98.1870.3).
- Zweifel, P. F. 1955. Nuclear orbital assignments for TA-180. *Phys. Rev.* 98 (4):1174–1174.



- Zweifel, P. F. 1954. Second-order corrections to beta spectra. *Phys. Rev.* 95 (1):112–112. doi:[10.1103/PhysRev.95.112](https://doi.org/10.1103/PhysRev.95.112).
- Zweifel, P. F. 1954. Capture-positron branching ratios. *Phys. Rev.* 96 (6):1572–1575. doi:[10.1103/PhysRev.96.1572](https://doi.org/10.1103/PhysRev.96.1572).
- Zweifel, P. F. 1954. Positron-capture branching ratios. *Phys. Rev.* 93 (4):915–915.

### **Conference summaries and book reviews (1961–2014)**

- Zweifel, P. F. 2014. Report on ICTT-23, Santa Fe, New Mexico, September 15–20, 2013. *JCTT* 43 (1–7):i–iii. doi:[10.1080/23324309.2014.1002694](https://doi.org/10.1080/23324309.2014.1002694).
- Zweifel, P. F. 2001. Book review: Baseball’s all-time best hitters. *TTSP* 30 (7):699–702. doi:[10.1081/TT-100107424](https://doi.org/10.1081/TT-100107424).
- Dorning, J., W. Greenberg, W. Song, P. Zweifel, and P. Nelson. 2001. Particle transport in gases, plasmas, semiconductors, and nuclear systems: The sixteenth international conference on transport theory, May 10–15, 1999, Atlanta, Georgia. *TTSP* 30 (1):91–118. doi:[10.1081/TT-100104456](https://doi.org/10.1081/TT-100104456).
- Zweifel, P. F. 2000. Book reviews: “Applied nonlinear semigroups” and “A concise guide to semigroups and evolution equations”. *TTSP* 29 (7):825–829. doi:[10.1080/00411450008200004](https://doi.org/10.1080/00411450008200004).
- Zweifel, P. F. 2000. Book review: The sun in the church. *TTSP* 29 (6):723–729. doi:[10.1080/00411450008214532](https://doi.org/10.1080/00411450008214532).
- Zweifel, P. F. 1998. Second international conference on quantum kinetic theory. *TTSP* 27 (3–4):395–402. doi:[10.1080/00411459808205634](https://doi.org/10.1080/00411459808205634).
- Ganapol, B. D., G. C. Pomraning, and P. F. Zweifel. 1998. Fifteenth international conference on transport theory, Göteborg, Sweden, June 1–7, 1997. *TTSP* 27 (2):177–197. doi:[10.1080/00411459808205814](https://doi.org/10.1080/00411459808205814).
- Zweifel, P. F. 1996. Conference report: “On latest developments and fundamental advances in radiative transfer”. *TTSP* 25 (7):869–876. doi:[10.1080/00411459608203552](https://doi.org/10.1080/00411459608203552).
- Zweifel, P. F. 1996. International conference on quantum kinetic theory. *TTSP* 25 (6):723–728. doi:[10.1080/00411459608222921](https://doi.org/10.1080/00411459608222921).
- Greenberg, W., and P. F. Zweifel. 1995. Fourteenth international conference on transport theory, 12–17 June, 1995, Beijing, P. R. China. *TTSP* 24 (9):1423–1433. doi:[10.1080/00411459508206034](https://doi.org/10.1080/00411459508206034).
- Greenberg, W., and P. F. Zweifel. 1994. Thirteenth international conference on transport theory: 10–14 May 1993, Riccioni, Italy. *TTSP* 23 (4):541–552. doi:[10.1080/00411459408203879](https://doi.org/10.1080/00411459408203879).
- Zweifel, P. F. 1993. The 25th symposium on mathematical physics, Toruń, Poland, 8–11 December, 1992. *TTSP* 22 (4):571–579. doi:[10.1080/00411459308203830](https://doi.org/10.1080/00411459308203830).

- Greenberg, W., and P. F. Zweifel. 1992. Twelfth international conference on transport theory, 12–16 August 1991, Albuquerque, New Mexico. *TTSP* 21 (3):277–290. doi:10.1080/00411459208203924.
- Zweifel, P. F. 1992. Book review: Fractal physiology and chaos in medicine. *Phys. Today* 45 (3):68–70. doi:10.1063/1.2809583.
- Glenn, T. A., and P. F. Zweifel. 1990. A report on the PCT, SPIN, and STATISTICS symposium. *TTSP* 19 (2):189–196. doi:10.1080/00411459008214511.
- Zweifel, P. F. 1989. Book review: From clocks to chaos: The rhythms of life. *Phys. Today* 42 (7):72–72. doi:10.1063/1.2811091.
- Zweifel, P. F. 1989. A report on the Gibbs symposium. *TTSP* 18 (5–6):527–537. doi:10.1080/00411458908204702.
- Greenberg, W., and P. F. Zweifel. 1988. Mathematical problems in the kinetic theory of gases Oberwolfach, 8–14 May 1988. *TTSP* 17 (5–6):651–657. doi:10.1080/00411458808230882.
- Zweifel, P. F. 1988. Book review: Problemi di fisica del reattore nucleare, by G. Spiga, P. Vestrucci and A. Magnavacca, (Pitagora Editrice, Bologna, 1985). *TTSP* 17 (4):461–462. doi:10.1080/00411458808230875.
- Zweifel, P. F. 1988. NATO at NOTO. *TTSP* 17 (1):115–129. doi:10.1080/00411458808230858.
- Greenberg, W., and P. F. Zweifel. 1987. Tenth international conference on transport theory, 23–26 March 1987, La Jolla, California. *TTSP* 16 (8):1167–1175. doi:10.1080/00411458708204612.
- Zweifel, P. F. 1987. Book review: Marc Kac “Enigmas of chance. An autobiography”. *TTSP* 16 (7):1029–1031. doi:10.1080/00411458708204606.
- Zweifel, P. F. 1987. Book review: A review of “Betrayers of the truth”. *TTSP* 16 (1):127–131. doi:10.1080/00411458708204300.
- Zweifel, P. F. 1986. Blacksburg comes to Montecatini, June 10–14, 1985. *TTSP* 15 (3):375–387. doi:10.1080/00411458608210460.
- Zweifel, P. F. 1986. Book review: The unity of the fundamental interactions. *Nucl. Technol.* 73 (3):389–389. doi:10.13182/NT86-A16081.
- Zweifel, P. F. 1984. Methods of fluid dynamics in nuclear physics, Catania, Italy, April 9–11, 1984, an interdisciplinary workshop. *TTSP* 13 (5):649–661. doi:10.1080/00411458408211664.
- Zweifel, P. F. 1984. Book review: Spectral methods in linear transport theory. By H. G. Kaper, C. G. Lekkerkerker and J. Hejtmanek. *SIAM Rev.* 26 (4):604–606. doi:10.1137/1026130.
- Zweifel, P. F. 1983. A report on the eighth international conference on transport-theory. *TTSP* 12 (2):197–209. doi:10.1080/00411458308224577.
- Greenberg, W., and P. F. Zweifel. 1983. Mathematical problems in kinetic theory: Oberwolfach conference, 22–26 November 1982. *TTSP* 12 (1):85–101. doi:10.1080/00411458308212734.

- Zweifel, P. F. 1982. Wightman conference. *TTSP* 11 (3–4):249–262. doi:[10.1080/00411458208245745](https://doi.org/10.1080/00411458208245745).
- Zweifel, P. F. 1982. Book review: Gravitation, quanta and the universe. *Nucl. Technol.* 57 (2):308–308. doi:[10.13182/NT82-A26296](https://doi.org/10.13182/NT82-A26296).
- Zweifel, P. F. 1981. Invariance principle and its applications, a symposium held at Byurakan astronomical observatory, Byurakan, Armenia U.S.S.R., October 26–30, 1981. *TTSP* 10 (4):191–198. doi:[10.1080/00411458108247971](https://doi.org/10.1080/00411458108247971).
- Zweifel, P. F. 1981. Book review: Partial differential equations of mathematical physics. *TTSP* 10 (3):133–134. doi:[10.1080/00411458108247964](https://doi.org/10.1080/00411458108247964).
- Zweifel, P. F. 1981. Book review: Operator methods in quantum mechanics. *TTSP* 10 (3):131–132. doi:[10.1080/00411458108247963](https://doi.org/10.1080/00411458108247963).
- Zweifel, P. F. 1981. Book review: Annual review of nuclear and particle science: Volume 28. *Nucl. Technol.* 52 (3):444–445. doi:[10.13182/NT81-A32723](https://doi.org/10.13182/NT81-A32723).
- Greenberg, W., M. Williams, and P. F. Zweifel. 1981. A report on the seventh international conference on transport theory. *TTSP* 10 (3):115–130. doi:[10.1080/00411458108247962](https://doi.org/10.1080/00411458108247962).
- Zweifel, P. F. 1980. Book review: Advanced mathematical methods for scientists and engineers. *Nucl. Sci. Eng.* 76 (3):374–374. doi:[10.13182/NSE80-A21332](https://doi.org/10.13182/NSE80-A21332).
- Greenberg, W., and P. F. Zweifel. 1979. Sixth (inter)national conference on transport theory, Tucson, Arizona, April 2–6, 1979. *TTSP* 8 (2):117–123. doi:[10.1080/00411457908205900](https://doi.org/10.1080/00411457908205900).
- Zweifel, P. F. 1978. Book reviews: “Methods of Modern Mathematical Physics, Vol. IV Analysis of Operators,” “PCT, Spin and Statistics, and All That” and “Representations of the Rotation and Lorentz Groups”. *TTSP* 7 (4):191–197. doi:[10.1080/00411457808204627](https://doi.org/10.1080/00411457808204627).
- Zweifel, P. F. 1978. Conference on transport theory, Firenze, Italy, June 7–9, 1978. *TTSP* 7 (3):123–133. doi:[10.1080/00411457808204622](https://doi.org/10.1080/00411457808204622).
- Greenberg, W., and P. F. Zweifel. 1977. Transport theoretical methods in physics: an international workshop at Graz, Austria. *TTSP* 6 (4):219–226. doi:[10.1080/00411457708204328](https://doi.org/10.1080/00411457708204328).
- Greenberg, W., and P. F. Zweifel. 1977. A report on the fifth conference on transport theory. *TTSP* 6 (2–3):159–168. doi:[10.1080/00411457708247958](https://doi.org/10.1080/00411457708247958).
- Zweifel, P. F., and I. Kuščer. 1977. Mathematical methods in transport theory: Conference held at Oberwolfach, Germany, October 31–November 5, 1976. *TTSP* 6 (2–3):151–158. doi:[10.1080/00411457708247957](https://doi.org/10.1080/00411457708247957).
- Greenberg, W., and P. F. Zweifel. 1976. Recent developments in kinetic theories, a conference at Blacksburg, Va. May 31–June 2, 1976. *TTSP* 5 (4):207–218. doi:[10.1080/00411457608230830](https://doi.org/10.1080/00411457608230830).

- Zweifel, P. F. 1976. Book review: Methods of modern mathematical physics, Volume II. Fourier analysis, self-adjointness. *TTSP* 5 (2–3):205–206. doi:[10.1080/00411457608230829](https://doi.org/10.1080/00411457608230829).
- Kaper, H. G., and P. F. Zweifel. 1975. A report on the fourth conference on transport-theory. *TTSP* 4 (3):105–123. doi:[10.1080/00411457508214534](https://doi.org/10.1080/00411457508214534).
- Zweifel, P. F. 1975. International symposium on nuclear power technology and economics. *TTSP* 4 (3):97–103. doi:[10.1080/00411457508214533](https://doi.org/10.1080/00411457508214533).
- Zweifel, P. F. 1974. Book review: Scattering theory. *Nucl. Sci. Eng.* 53 (4):489–489. doi:[10.13182/NSE74-A23382](https://doi.org/10.13182/NSE74-A23382).
- Zweifel, P. F. 1973. Book review: Statistical mechanics at the turn of the decade. *TTSP* 3 (1):81–82. doi:[10.1080/00411457308205115](https://doi.org/10.1080/00411457308205115).
- Zweifel, P. F. 1973. Book review: Mathematical methods of quantum mechanics. *TTSP* 3 (1):79–80. doi:[10.1080/00411457308205114](https://doi.org/10.1080/00411457308205114).
- Zweifel, P. F. 1973. Conference on mathematical aspects of transport theory. *TTSP* 3 (1):65–77. doi:[10.1080/00411457308205113](https://doi.org/10.1080/00411457308205113).
- Kuščer, I., and P. F. Zweifel. 1972. 100 years Boltzmann equation, a meeting report. *TTSP* 2 (4):365–372. doi:[10.1080/00411457208232548](https://doi.org/10.1080/00411457208232548).
- Zweifel, P. F. 1972. Book review: Algebraic methods in statistical mechanics and quantum field theory. *TTSP* 2 (3):271–272. doi:[10.1080/00411457208232541](https://doi.org/10.1080/00411457208232541).
- Zweifel, P. F., and D. Kaplan. 1971. Book review: Clustering phenomena in nuclei. *Nucl. Technol.* 10 (1):91–91. doi:[10.13182/NT71-A30952](https://doi.org/10.13182/NT71-A30952).
- Zweifel, P. F. 1971. Book review: Intermediate energy nuclear physics. *Nucl. Sci. Eng.* 45 (1):104–105. doi:[10.13182/NSE71-A20355](https://doi.org/10.13182/NSE71-A20355).
- Zweifel, P. F. 1968. Book review: Modal approximations: Theory and an application to reactor physics. *Nucl. Sci. Eng.* 34 (3):348–349. doi:[10.13182/NSE68-A21107](https://doi.org/10.13182/NSE68-A21107).
- Zweifel, P. F. 1968. Summary. In Neutron thermalization and reactor spectra. Proceedings of a Symposium, Ann Arbor, 17–21 July 1967, Vol. II, 511–518. Vienna: IAEA.
- Zweifel, P. F. 1967. Book review: The slowing down and thermalization of neutrons, by M. M. R. Williams. *J. Franklin Inst.-Eng. & Appl. Math.* 283 (4):350–350. doi:[10.1016/0016-0032\(67\)90058-0](https://doi.org/10.1016/0016-0032(67)90058-0).
- Zweifel, P. F., and W. Kerr. 1967. Theoretical calculations gain importance in reactor design. *Phys. Today* 20 (11):116–122. doi:[10.1063/1.3034007](https://doi.org/10.1063/1.3034007).
- Zweifel, P. F. 1966. Book review: Thermal neutron scattering. *Nucl. Sci. Eng.* 26 (2):285–285. doi:[10.13182/NSE66-A28176](https://doi.org/10.13182/NSE66-A28176).
- Zweifel, P. F. 1966. Reporter's remarks on contributed papers on neutron thermalization. In Proceedings of the National Topical Meeting on Reactor Physics in the Resonance and Thermal Regions: An Addendum,

February 7–9, 1966, BNL 50004 (C-48), 2–8. Upton, NY: Brookhaven National Laboratory.

Zweifel, P. F. 1961. Book review: Reactor analysis, by Robert V. Meghreblian and David K. Holmes. *Nucl. Sci. Eng.* 9 (4):522 – 523. doi:10.13182/NSE61-A25918.

### **Other (1956–2014)**

Zweifel, P. F., N. J. McCormick, and L. H. Case. 2014. Biographical memoir of Ken Case. *JCTT* 43 (1–7):109–127. doi:10.1080/00411450.2014.910229.

Zweifel, P. F. 2013. Letter to editor: Nathan Rosen and Black Mountain. *Notices Am. Math. Soc.* 60 (5):543–543.

Zweifel, P. F., N. J. McCormick, and L. H. Case. 2013. Kenneth M. Case, 1923–2006. U.S. National Academy of Sciences. [www.nasonline.org/publications/biographical-memoirs/memoir-pdfs/case-kenneth.pdf](http://www.nasonline.org/publications/biographical-memoirs/memoir-pdfs/case-kenneth.pdf).

Zweifel, P. F. 2012. Letter to editor: Lost in translation. *Am. Scholar* 81 (2):5–5.

Zweifel, P. F. 2008. Letter to editor: Rome’s gossip columnist. *Am. Scholar* 77 (3):6–6.

Zweifel, P. F. 2005. The mathematical physics of music. *J. Stat. Phys.* 121 (5–6):1097–1104. doi:10.1007/s10955-005-7581-1.

Zweifel, P. F. 2003. Ivan Kuščer, orthogonality and all that. *TTSP* 32 (5–7):429–443. doi:10.1081/TT-120024762.

McCormick, N. J., and P. F. Zweifel. 2003. Ivan Kuščer, 1918–2000. *TTSP* 32 (3–4):xv–xviii. doi:10.1081/TT-120024758.

Zweifel, P. F. 1997. The three faces of “Eve” – a second-person analysis of Italian opera. *Opera Quart.* 13 (3):85–95. doi:10.1093/oq/13.3.85.

Zweifel, P. F. 1997. Communications. *Indiana Theory Rev.* 18 (1):121–128.

Zweifel, P. F. 1996. Generalized diatonic and pentatonic scales: a group-theoretic approach. *Perspect. New Music* 34 (1):140–161. doi:10.2307/833490.

Nonnenmacher, D. J. F., T. F. Nonnenmacher, and P. F. Zweifel. 1993. Kepler, Einstein, and Ulm. *Mathemat. Intellig.* 15 (2):50–51. doi:10.1007/BF03024192.

Long, D. D., T. G. Teates, and P. F. Zweifel. 1992. A program for excellence in physics and physical science teaching. *J. Sci. Teacher Educ.* 3 (4):109–113. doi:10.1007/BF02614778.

Cairns, J., Jr and P. F. Zweifel eds. 1989. *On global warming: Atmospheric carbon dioxide and climate change*. Blacksburg: Virginia Polytechnic Institute and State University.

Zweifel, P. F. 1987. Letter to editor: Music. *Mathemat. Intellig.* 9 (3):3–3. doi:10.1007/BF03023945.

- Zweifel, P. F. 1987. Letter to editor: The bee. *Mathemat. Teach.* 80 (8):605–605.
- Zweifel, P. F. 1986. Some remarks about bridge probabilities. *Math. Magazine* 59 (3):153–157. doi:[10.2307/2690205](https://doi.org/10.2307/2690205).
- Zweifel, P. F. 1984. Just tuning and the unavoidable discrepancies. *Indiana Theory Rev.* 15 (2):89–120.
- Zweifel, P. F. 1981. Editorial. *TTSP* 10 (4):iii–iii. doi:[10.1080/00411458108247966](https://doi.org/10.1080/00411458108247966).
- Zweifel, P. F. 1980. The scientific work of Albert Einstein. *Ann. Nucl. Energy* 7 (4–5):279–287. doi:[10.1016/0306-4549\(80\)90076-6](https://doi.org/10.1016/0306-4549(80)90076-6).
- Zweifel, P. F. 1979. Letter to editor: Sexist error. *Phys. Today* 32 (12):79–79. doi:[10.1063/1.2995336](https://doi.org/10.1063/1.2995336).
- Zweifel, P. F. 1979. Letter to editor: Unidentified man recognized. *Phys. Today* 32 (1):96–96. doi:[10.1063/1.2995386](https://doi.org/10.1063/1.2995386).
- Greenberg, W., and P. F. Zweifel. 1978. Editorial. *TTSP* 7 (3):iii–iii. doi:[10.1080/00411457808204619](https://doi.org/10.1080/00411457808204619).
- Zweifel, P. F., and A. Guynn. 1975. Energy conservation and economics. In *International Symposium on Nuclear Power Technology and Economics* (Taipei, Republic of China, January 13–20, 1975), ed. S. H. Chen, and S. Yip, Vol. I, 123–132. Taiwan: National Science Council.
- Zweifel, P. F., and A. Guynn. 1974. Are there viable alternatives to nuclear power? *Chemistry* 47 (8):16–18.
- Zweifel, P. F. 1971. Editorial. *TTSP* 1 (4):i–i. doi:[10.1080/00411457108231451](https://doi.org/10.1080/00411457108231451).
- Hurwitz, H., Jr, R. A. Pfeiffer, and P. F. Zweifel. 1959. Numerical quadrature of Fourier transform integrals II. *Mathemat. Tables Other Aids Comput.* 13 (66):87–90. doi:[10.2307/2001957](https://doi.org/10.2307/2001957).
- Hurwitz, H., Jr, and P. F. Zweifel. 1956. Numerical quadrature of Fourier transform integrals. *Mathemat. Tables Other Aids Comput.* 10 (55):140–149. doi:[10.2307/2002485](https://doi.org/10.2307/2002485).

*The authors appreciate the editorial suggestions by a reviewer.*