

Objektyp: **ReferenceList**

Zeitschrift: **L'Enseignement Mathématique**

Band (Jahr): **26 (1980)**

Heft 1-2: **L'ENSEIGNEMENT MATHÉMATIQUE**

PDF erstellt am: **12.07.2024**

Nutzungsbedingungen

Die ETH-Bibliothek ist Anbieterin der digitalisierten Zeitschriften. Sie besitzt keine Urheberrechte an den Inhalten der Zeitschriften. Die Rechte liegen in der Regel bei den Herausgebern. Die auf der Plattform e-periodica veröffentlichten Dokumente stehen für nicht-kommerzielle Zwecke in Lehre und Forschung sowie für die private Nutzung frei zur Verfügung. Einzelne Dateien oder Ausdrucke aus diesem Angebot können zusammen mit diesen Nutzungsbedingungen und den korrekten Herkunftsbezeichnungen weitergegeben werden. Das Veröffentlichen von Bildern in Print- und Online-Publikationen ist nur mit vorheriger Genehmigung der Rechteinhaber erlaubt. Die systematische Speicherung von Teilen des elektronischen Angebots auf anderen Servern bedarf ebenfalls des schriftlichen Einverständnisses der Rechteinhaber.

Haftungsausschluss

Alle Angaben erfolgen ohne Gewähr für Vollständigkeit oder Richtigkeit. Es wird keine Haftung übernommen für Schäden durch die Verwendung von Informationen aus diesem Online-Angebot oder durch das Fehlen von Informationen. Dies gilt auch für Inhalte Dritter, die über dieses Angebot zugänglich sind.

and $P = \cap I_f$, where the intersection is taken over all positive functionals on A . The algebra A is called P -commutative if $xy - yx \in P$ for all x, y in A . Tiller establishes the following two theorems relating properties of the spectral radius to P -commutativity:

(1) Let A be a Banach $*$ -algebra which is symmetric and P -commutative. Then if $x, y \in A$, $\rho(xy) \leq \rho(x)\rho(y)$ and $\rho(x+y) \leq \rho(x) + \rho(y)$.

(2) Let A be a Banach $*$ -algebra with bounded approximate identity. If $\rho(x^*x) \leq \rho(x)^2$ for every x in A , then A is P -commutative.

BIBLIOGRAPHY

- [1] ACKERMANS, S. T. M. A case of strong spectral continuity. *Nederl. Akad. Wetensch. Proc. Ser. A 71 = Indag. Math.* 30 (1968), 455-459. MR 40 #739.
- [2] ALBERT, A. A. A note of correction. *Bull. Amer. Math. Soc.* 55 (1949), 1191. MR 11, 76.
- [3] ——— Absolute-valued real algebras. *Ann. of Math. (2)* 48 (1947), 495-501. MR 8, 561.
- [4] ——— Absolute-valued algebraic algebras. *Bull. Amer. Math. Soc.* 55 (1949), 763-768. MR 11, 76.
- [5] ALLAN, G. R. A spectral theory for locally convex algebras. *Proc. London Math. Soc. (3)* 15 (1965), 399-421. MR 31 #619.
- [6] ARENS, R. Linear topological division algebras. *Bull. Amer. Math. Soc.* 53 (1947), 623-630. MR 9, 6.
- [7] AUPÉIT, B. Almost commutative Banach algebras. *Notices Amer. Math. Soc.* 18 (1971), 191.
- [8] ——— Continuité du spectre dans les algèbres de Banach avec involution. *Pacific J. Math.* 56 (1975), 321-324. MR 51 #11117.
- [9] ——— Caractérisation spectrale des algèbres de Banach commutatives. *Pacific J. Math.* 63 (1976), 23-35. MR 54 #3409.
- [10] ——— Sur les conjectures de Hirschfeld et Żelazko dans les algèbres de Banach. *Bull. Soc. Math. France* 104 (1976), 185-193. MR 54 #8290.
- [11] ——— On scarcity of operators with finite spectrum. *Bull. Amer. Math. Soc.* 82 (1976), 485-486. MR 53 #3699.
- [12] ——— Caractérisation spectrale des algèbres de Banach de dimension finie. *J. of Funct. Anal.* 26 (1977), 232-250. MR 56 #12887.
- [13] ——— Continuité uniforme du spectre dans les algèbres de Banach avec involution. *C. R. Acad. Sci. Paris, Ser. A-B*, 284 (1977), A1125-A1127. MR 55 #8806.
- [14] ——— Continuité et uniforme continuité du spectre dans les algèbres de Banach. *Studia Math.* 61 (1977), 99-114. MR 56 #12883.
- [15] ——— La deuxième conjecture de Hirschfeld-Żelazko pour les algèbres de Banach est fautive. *Proc. of Amer. Math. Soc.* 70 (1978), 161-162.
- [16] ——— *Propriétés spectrales des algèbres de Banach*. Springer Lecture Notes, to appear.
- [17] AURORA, S. Multiplicative norms for metric rings. *Pacific J. Math.* 7 (1957), 1279-1304. MR 19, 1186.
- [18] ——— On power multiplicative norms. *Amer. J. Math.* 80 (1958), 879-894. MR 20 #5192.

- [19] AURORA, S. The embedding of certain metric fields. *Mich. Math. J.* 7 (1960), 123-128. MR 22 #12171.
- [20] ——— A note on certain connected metric division rings. *Mich. Math. J.* 7 (1960), 129-132. MR 22 #12172.
- [21] ——— On normed algebras whose norms satisfy polynomial identities. *Canadian J. Math.* 13 (1961), 664-674. MR 24 #A2258.
- [22] ——— On normed algebras which satisfy a reality condition. *Canadian J. Math.* 13 (1961), 675-682. MR 24 #A2259.
- [23] ——— On connected normed algebras whose norms satisfy a reality condition. *Illinois J. Math.* 6 (1962), 488-499. MR 26 #620.
- [24] ——— On normed rings with monotone multiplication. *Pacific J. Math.* 33 (1970), 15-20. MR 41 #4235.
- [25] ——— Normed fields which extend normed rings of integers. *Pacific J. Math.* 33 (1970), 21-28. MR 42 #1810.
- [26] BAER, R. Normierte Funktionenalgebren. *J. Reine Angew. Math.* 204 (1960), 41-66. MR 25 #5397.
- [27] BAKER, J. W. and J. S. PYM. A remark on continuous bilinear mappings. *Proc. Edinburgh Math. Soc.* (2) 17 (1970/71), 245-248. MR 46 #2429.
- [28] BAUMANN, V. Normierte Funktionenalgebren, II. *J. Reine Angew. Math.* 204 (1960), 67-73. MR 25 #5398.
- [29] BOEHME, T. K. On the limits of the Gelfand-Mazur theorem. *Proc. Conf. on Convergence Spaces*, Univ. of Nevada, Reno, 1976. MR 55 #3788.
- [30] BONSALE, F. and J. DUNCAN. *Completed Normed Algebras*. Springer-Verlag, New York, 1973. MR 54 #11013.
- [31] BOYADŽIEV, H. Commutativity in Banach algebras and elements with real spectra. *C. R. Acad. Bulgare Sci.* 29 (1976), 1401-1403. MR 55 #8802.
- [32] VAN CASTEREN, J. On algebras with a smooth norm. *Bull. Soc. Math. Belgique* 26 (1974), 347-350. MR 56 #16378.
- [33] CHABAUTY, R. Une généralisation du théorème de Gelfand-Mazur. *C. R. Acad. Sci. Paris, Ser. A-B*, 275 (1972), A519-A522. MR 46, 2430.
- [34] CRABB, M. J., J. DUNCAN and C. M. Mc GREGOR. Characterizations of commutativity for C^* -algebras. *Glasgow Math. J.* 15 (1974), 172-175. MR 50 #14252.
- [35] DUNCAN, J. and P. J. TAYLOR. Norm inequalities for C^* -algebras. *Proc. Roy. Soc. Edinburgh, Sect. A*, 75 (1975/76), no. 2, 119-129. MR 56 #12896.
- [36] DUNCAN, J. and A. TULLO. Finite dimensionality, nilpotents and quasi-nilpotents in Banach algebras. *Proc. Edinburgh Math. Soc.* (2) 19 (1974/75), 45-49. MR 49 #9631.
- [37] EDWARDS, R. E. Multiplicative norms on Banach algebras. *Proc. Camb. Philos. Soc.* 47 (1951), 473-474. MR 13, 256.
- [38] GELFAND, I. M. Normierte Ringe. *Mat. Sbornik* 9 (1941), 3-24. MR 3, 51.
- [39] GELFAND, I. M., D. A. RAIKOV and G. E. SHILOV. Commutative normed rings. *Uspehi Matem. Nauk.* 1 (1946), 48-146. MR 10, 258; *Amer. Math. Soc. Transl.* (2) 5 (1957), 115-220. MR 18, 714.
- [40] GELFAND, I. M., D. A. RAIKOV and G. E. SHILOV. *Commutative normed rings*. Chelsea, New York, 1964. MR 34 #4940.
- [41] GLEICHGEWICHT, B. A remark on absolute valued algebras. *Colloq. Math.* 11 (1963), 29-30. MR 28 #5349.
- [42] GOWDA, M. S. Numerical range proof of Edwards' theorem. *Tamkang J. Math.* 8 (1977), 77-80. MR 56 #12884.
- [43] HERSTEIN, I. N. *Topics in algebra*. Blaisdell, (Waltham, Mass.) 1964. MR 30 #2028.
- [44] HILLE, E. and R. S. PHILLIPS. *Functional analysis and semigroups*. Amer. Math. Soc., Providence, R. I., 1957. MR 19, 664.

- [45] HIRSCHFELD, R. A. On Hilbertizable Banach algebras. *Bull. Soc. Math. Belgique* 25 (1973), 331-333. MR 56 #16377.
- [46] HIRSCHFELD, R. A. and S. ROLEWICZ. A class of non-commutative Banach algebras without divisors of zero. *Bull. Acad. Polon. Sci. Sér. Sci. Math. Astronom. Phys.* 17 (1969), 751-753. MR 40 #7802.
- [47] HIRSCHFELD, R. A. and W. ZELAZKO. On spectral norm Banach algebras. *Bull. Acad. Pol. Sci.* 16 (1968), 195-199. MR 37 #4621.
- [48] INGELSTAM, L. Hilbert algebras with identity. *Bull. Amer. Math. Soc.* 69 (1963), 794-796. MR 27 #4096.
- [49] ——— Non-associative normed algebras and Hurwitz' problem. *Ark. Mat.* 5 (1964), 231-238. MR 29 #5116.
- [50] ITÔ, S. An elementary proof of a fundamental theorem on normed rings. *Sûgaku* 14 (1962/63), 108-110. (Japanese). MR 26 #4200.
- [51] KAMETANI, S. An elementary proof of the fundamental theorem of normed fields. *J. Math. Soc. Japan* 4 (1952), 96-99. MR 14, 240.
- [52] KAPLANSKY, I. Topological rings. *Bull. Amer. Math. Soc.* 54 (1948), 809-826. MR 10, 179.
- [53] ——— Normed algebras. *Duke Math. J.* 16 (1949), 399-418. MR 11, 115.
- [54] LE PAGE, C. Sur quelques conditions entraînant la commutativité dans les algèbres de Banach. *C. R. Acad. Sci. Paris, Ser. A-B*, 265 (1967), A235-A237. MR 37 #1999.
- [55] LORCH, E. R. The theory of analytic functions in normed Abelian vector rings. *Trans. Amer. Math. Soc.* 54 (1943), 414-425. MR 5, 100.
- [56] MARKUSHEVICH, A. I. *Theory of functions of a complex variable*. Trans. by Richard A. Silverman, Vol. I, II. Prentice-Hall, Englewood Cliffs, 1965. MR 30 #2125, MR 31 #5965.
- [57] MAZUR, S. Sur les anneaux linéaires. *C. R. Acad. Sci. Paris* 207 (1938), 1025-1027.
- [58] MOCANU, Gh. A remark on a commutativity criterion in Banach algebras. (Romanian. French summary) *Stud. Cerc. Mat.* 21 (1969), 947-952. MR 43 #5311.
- [59] ——— Sur quelques critères de commutativité pour une algèbre de Banach. *An Univ. Bucureşti, Mat.-Mec.* 20 (1971), 127-129. MR 46 #9739.
- [60] ——— On the spectral radius of an element of a Banach algebra. *Bull. Math. Soc. Sci. Math. R. S. Roumanie (N.S.)* 17 (65) (1973), 413-416 (1975). MR 52 #1310.
- [61] MIYANAGA, Y. A note on Banach algebras. *Proc. Japan Acad.* 32 (1956), 176. MR 17, 1112.
- [62] MÜLLER, V. On the discontinuity of the spectral radius in Banach algebras. *Commentationes math. Univ. Carolinae* 18 (1977), 591-598. Zbl. 358.46032.
- [63] NAIMARK, M. A. *Normed Rings*. Second English edition, Groningen, The Netherlands, 1964. MR 34 #4928.
- [64] ONO, T. Elementary proof of the basic theorem of normed rings. *Sûgaku* 9 (1957/58), 236. (Japanese) MR 22 #5904.
- [65] OSTROWSKI, A. Über einige Lösungen der Funktionalgleichung $\varphi(x)\varphi(y) = \varphi(xy)$. *Acta Math.* 41 (1918), 271-284.
- [66] PALAIS, R. S. The classification of real division algebras. *Amer. Math. Monthly* 75 (1968), 366-368. MR 37 #4119.
- [67] PONTRJAGIN, L. Über stetige algebraische Koerper. *Ann. of Math.* 33 (1932) 163-174.
- [68] ——— *Topological Groups*. Princeton U. Press, Princeton, N. J., 1939. MR 1, 44.
- [69] PTÁK, V. Derivations, commutators and the radical. *Manuscripta Math.* 23 (1978), 355-362.

- [70] PTÁK, V. and J. ZEMÁNEK. On uniform continuity of the spectral radius in Banach algebras. *Manuscripta Math.* 20 (1977), 177-189. MR 56 #1065.
- [71] RAMASWAMI, V. Normed algebras, isomorphism, and the associative postulate. *J. Indian Math. Soc. (N. S.)* 14 (1950), 47-64. MR 12, 421.
- [72] RICKART, C. E. An elementary proof of a fundamental theorem in the theory of Banach algebras. *Mich. Math. J.* 5 (1958), 75-78. MR 20 #4786.
- [73] ——— *General Theory of Banach algebras*. Van Nostrand, Princeton, N. J., 1960. MR 22 #5903.
- [74] SEGAL, I. E. Postulates for general quantum mechanics. *Ann. of Math. (2)* 48 (1947), 930-948. MR 9, 241.
- [75] SEID, H. A. A corollary to the Gelfand-Mazur theorem. *Amer. Math. Monthly* 77 (1970), 282-283. MR 41 #4253.
- [76] SHAFAREVICH, I. On the normalizability of topological fields. *Dokl. Akad. Nauk. SSSR* 40 (1943), 133-135. MR 6, 164.
- [77] SHILOV, G. An extension of maximal ideals. *C. R. (Doklady) Acad. Sci. URSS (N. S.)* 29 (1940), 83-84. MR 2, 314.
- [78] SIMMONS, G. F. *Introduction to topology and modern analysis*. McGraw-Hill, New York, 1963. MR 26 #4145.
- [79] SINCLAIR, A. M. *Automatic continuity of linear operators*. London Math. Soc. Lecture Note Series 21. Cambridge Univ. Press, Cambridge, 1976. Zbl. 313.47029.
- [80] SŁODKOWSKI, Z., W. WOJTYŃSKI, and J. ZEMÁNEK. A note on quasi-nilpotent elements of a Banach algebra. *Bull. Acad. Polon. Sci., Sér. Sci. math. astronom. phys.*, 25 (1977), 131-134. MR 55 #11043.
- [81] SMILEY, M. F. Real Hilbert algebras with identity. *Proc. Amer. Math. Soc.* 16 (1965), 440-441. MR 31 #591.
- [82] SPICER, D. A commutativity theorem for Banach algebras. *Colloq. Math.* 27 (1973), 107-108. MR 48 #9402.
- [83] SRINIVASACHARYULU, K. Remarks on Banach algebras. *Bull. Soc. Roy. Sci. Liège* 43 (1974), 523-525. MR 51 #11114.
- [84] STONE, M. H. On the theorem of Gelfand-Mazur. *Ann. Polon. Math.* 24 (1952), 238-240. MR 15, 132.
- [85] STRZELECKI, E. Metric properties of normed algebras. *Bull. Acad. Polon. Sci.* 10 (1962), 341-342. MR 26 #1767.
- [86] ——— Metric properties of normed algebras. *Studia Math.* 23 (1963), 41-51. MR 34 #2620.
- [87] ——— Algebras under a minimal norm. *Colloq. Math.* 11 (1963), 41-52. MR 28 #5351.
- [88] ——— Power-associative regular real normed algebras. *J. Austral. Math. Soc.* 6 (1966), 193-209. MR 33 #6435.
- [89] SUCIU, I. I. Eine natürliche Erweiterung der kommutativen Banach-algebra. *Rev. Math. Pures Appl. (Bucarest)* 7 (1962), 483-491. MR 31 #1571.
- [90] TAUSSKY, O. Sums of squares. *Amer. Math. Monthly* 77 (1970), 805-830. MR 42 #3020.
- [91] TAYLOR, A. E. The resolvent of a closed transformation. *Bull. Amer. Math. Soc.* 44 (1938), 70-74.
- [92] TILLER, W. P -commutative Banach $*$ -algebras. *Trans. Amer. Math. Soc.* 180 (1973), 327-336. MR 48 #877.
- [93] TORNHEIM, L. Normed fields over the real and complex fields. *Mich. Math. J.* 1 (1952), 61-68. MR 14, 131.
- [94] TURPIN, P. Sur une classe d'algèbres topologiques. *C. R. Acad. Sci. Paris* 263 (1966), A436-A439. MR 34 #6566.

- [95] URBANIK, K. Remarks on ordered absolute-valued algebras. *Colloq. Math.* 11 (1963), 31-39. MR 28 #5350.
- [96] URBANIK, K. and F. WRIGHT. Absolute-valued algebras. *Proc. Amer. Math. Soc.* 11 (1960), 861-866. MR 22 #11021.
- [97] VESENTINI, E. On Banach algebras satisfying a spectral maximum principle. *Ann. Scuola Norm. Sup. Pisa*, (3) 26 (1972), 933-943. MR 50 #14228.
- [98] WILLIAMS, J. P. On commutativity and the numerical range in Banach algebras. *J. Functional Analysis* 10 (1972), 326-329. MR 50 #14229.
- [99] WRIGHT, F. Absolute-valued algebras. *Proc. Nat. Acad. Sci. USA* 39 (1953), 330-332. MR 14, 944.
- [100] YOOD, B. On the extension of modular maximal ideals. *Proc. Amer. Math. Soc.* 14 (1963), 615-620. MR 27 #1848.
- [101] ZELAZKO, W. On a certain class of topological division algebras. *Bull. Acad. Polon. Sci.* 7 (1959), 201-203. MR 21 #3779.
- [102] — On the locally bounded and m -convex topological algebras. *Studia Math.* 19 (1960), 333-356. MR 23 #A4033.
- [103] — A theorem on B -division algebras. *Bull. Acad. Polon. Sci.* 8 (1960), 373-375. MR 23 #A3198.
- [104] — *Metric generalizations of Banach algebras*. Dept. of Math., Yale University (Lecture notes), 1964.
- [105] — Metric generalizations of Banach algebras. *Rozprawy Math.* 47 (1965), 70 pp. MR 33 #1752.
- [106] — On generalized topological divisors of zero in m -convex locally convex algebras. *Studia Math.* 28 (1966), 9-16. MR 34 #3362.
- [107] — On generalized topological divisors of zero in real m -convex algebras. *Studia Math.* 28 (1966/67), 241-244. MR 35 #7128.
- [108] — On topological divisors of zero in p -normed algebras without unit. *Colloq. Math.* 16 (1967), 231-234. MR 35 #3442.
- [109] — *Banach Algebras*. North Holland, Amsterdam, 1973.
- [110] ZEMÁNEK, J. Concerning spectral characterizations of the radical in Banach algebras. *Commentationes math. Univ. Carolinae* 17 (1976), 689-691. MR 55 #1070.
- [111] — A note on the radical of a Banach algebra. *Manuscripta Math.* 20 (1977), 191-196. MR 55 #8799.
- [112] — Properties of the spectral radius in Banach algebras. Banach Center Publications. Vol. *Spectral Theory*, to appear.
- [113] KHASBARDAR, S. and THAKARE, N. Commutativity in a Banach algebra. *Bollettino U.M.I.* (5) 15-A (1978), 581-584.
- [114] WARNER, S. A new approach to Gelfand-Mazur theory and the extension theorem. *Michigan Math. J.* 26 (1979), 13-17.

(Reçu le 9 mars 1979)

V. A. Belfi

Robert S. Doran

Department of Mathematics
 Texas Christian University
 Fort Worth, Texas 76129
 U.S.A.