Summaries of articles published in this issue

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(Publication of these summaries is permitted)

CHARLES SWARTZ, Las Cruces: *Linear operators on $C_X(\Omega)$ for Ω dispersed.* Czech. Math. J. *25 (100)*, (1975), 511—513. (Original paper.)

In a previous paper, the author gave a characterization of unconditionally converging and Dunford-Pettis operators on c_X, the B-space of X-valued convergent sequences when X is a B-space, by using some results of Batt on unconditionally converging series of bounded linear operators. In this note the author points out that the method of the previous paper can be employed to give characterizations of unconditionally converging, weakly compact, compact and Dunford-Pettis operators on $C_X(\Omega)$, the B-space of X-valued continuous functions on a dispersed, compact space Ω.

A. J. WARD, Cambridge: *A generalisation of almost compactness, with an associated generalisation of completeness.* Czech. Math. J. *25 (100)*, (1975), 514—530. (Original paper.)

It is proved that every Pervin proximity space (every quasi-uniform space) has a relatively Hausdorff P-compactification (P-completion). These are not unique and are not necessarily in one-one relationship to each other for a given P-precompact space. Some results are obtained concerning $T\,1$ and $T\,2$ ordinary completions of quasi-uniform spaces.

ROBERT J. PLEMMONS, Knoxville: *Note on a splitting approach to ill-conditioned least squares problems.* Czech. Math. J. *25 (100)*, (1975), 531—535. (Original paper.)

A splitting method is suggested that can sometimes be useful in solving the least squares problem $Ax = b$ where A is an $m \times n$ real matrix of rank n and $A^T A$ is ill-conditioned. Writing $A = M - N$ with M having the same range as A, the least squares solution is given by $\tilde{x} = [I - (M^T M)^{-1} \cdot M^T N]^{-1} (M^T M)^{-1} M^T b$. In such a splitting one wishes to choose M so that the condition number of $M^T M$ is considerably less than the condition number of $A^T A$ and this situation is illustrated using a standard example of an ill-conditioned problem. For a certain choice of M, the method reduces to the orthogonal factorization method usually obtained by Householder or Modified Gram-Schmidt transformations.

MILAN ŠTĚDRÝ and OTTO VEJVODA, Praha: *Periodic solutions to weakly nonlinear autonomous wave equations.* Czech. Math. J. *25 (100)*, (1975), 536—555. (Original paper.)

In this paper necessary resp. sufficient conditions for the existence of ω-periodic piecewise regular solutions to weakly nonlinear autonomous wave equations are derived. Further, the existence of 2π-periodic piecewise regular solutions for three types of the right hand side is proved.

HARALD K. WIMMER, Graz and ALLEN D. ZIEBUR, Binghamton: *Remarks on inertia theorems for matrices.* Czech. Math. J. *25* (*100*), (1975), 556—561. (Original paper.)

In this note the authors give a unified treatment of two inertia results on the Ljapounov matrix equation $A^*H + HA = C$, $C \geqq 0$ (positive semidefinite), $H = H^*$.

VÁCLAV HAVEL, Brno: *Universality property of free groupoid extensions of halfgroupoids and its geometrical meaning.* Czech. Math. J. *25* (*100*), (1975), 562—567. (Original paper.)

A new brief proof of the universality property of complex extensions of halfgroupoids (cf. the monograph of R. H. Bruck: *A survey of binary systems*, Berlin—Göttingen—Heidelberg 1958, pp. 1—8) is given and its geometric meaning is found. For geometric interpretations a convenient generalization of 3-nets is used.

JÁN JAKUBÍK, Košice: *Cardinal sums of linearly ordered groups.* Czech. Math. J. *25* (*100*), (1975), 568—575. (Original paper.)

In this paper conditions under which each *l*-subgroup of a cardinal sum of linearly ordered groups is again a cardinal sum of linearly ordered groups are investigated; this solves a problem proposed in a recent paper of Martinez.

JÁN JAKUBÍK, Košice: *Products of torsion classes of lattice ordered groups.* Czech. Math. J. *25* (*100*), (1975), 576—585. (Original paper.)

The aim of this paper is to prove a conjecture proposed in a recent paper of Martinez on torsion classes of lattice ordered groups.

PETER WINTGEN, Berlin: *Untermannigfaltigkeiten reduktiver Räume.* Czech. Math. J. *25* (*100*), (1975), 586—606. (Originalartikel.)

In dieser Arbeit wird der Versuch unternommen, eine Theorie der Untermannigfaltigkeiten affin zusammenhängender homogener Räume zu entwickeln. Zu diesem Zweck definieren wir gewisse verallgemeinerte G-Strukturen höherer Ordnung, die durch die Einbettung auf den Unter-mannigfaltigkeiten induziert werden und die Untermannigfaltigkeiten bis auf Kongruenz eindeutig bestimmen. Es werden die Integrabilitätsbedingun-gen für das entsprechende Existenzproblem angegeben. Für Untermannig-faltigkeiten reduktiver Räume lassen sich diese Integrabilitätsbedingungen auf einfache Weise in Krümmung und Windung gewisser Zusammenhänge höherer Ordnung ausdrücken, die den Strukturen invariant zugeordnet sind.

MIROSLAV FIEDLER, Praha: *Eigenvectors of acyclic matrices.* Czech. Math. J. *25* (*100*), (1975), 607—618. (Original paper.)

In this paper, it is shown that for acyclic matrices, i.e. symmetric matrices the graph of which does not contain any circuit, close relations exist between the signs of coordinates of eigenvectors and the position of the corresponding eigenvalues in the natural ordering according to magnitude.

MIROSLAV FIEDLER, Praha: *A property of eigenvectors of nonnegative symmetric matrices and its application to graph theory.* Czech. Math. J. *25* (*100*), (1975), 619—633. (Original paper.)

A theorem relating the eigenvectors of a nonnegative symmetric matrix A with the degree of reducibility of some principal submatrices of A is proved and applied in the theory of algebraic connectivity of non-directed graphs.

BOHDAN ZELINKA, Liberec: *Tolerances and congruences on tree algebras.* Czech. Math. J. *25* (*100*), (1975), 634—637. (Original paper.)

The concept of a tolerance as a reflexive and symmetric binary relation was introduced by E. C. Zeeman. Tolerances compatible with abstract algebras were studied in previous papers of the author. This paper concerns tolerances which are compatible with tree algebras (a concept introduced by L. Nebeský).

ALOIS ŠVEC, Praha: *On a global version of the Gauss-Bonnet theorem.* Czech. Math. J. *25* (*100*), (1975), 638—644. (Original paper.)

Let $M^m \subset E^{m+1}$ be a hypersurface; the induced fundamental tensors be a_{ij}, b_{ij}. On M^m, consider a tensor b'_{ij} such that the couple (a_{ij}, b'_{ij}) satisfies the Gauss and Codazzi equations. We give a partial solution of the following problem: Is there a hypersurface $M' \subset E^{m+1}$ such that its induced fundamental tensors are exactly a_{ij}, b'_{ij}?

ALOIS ŠVEC, Praha: *Several new characterizations of the sphere.* Czech. Math. J. *25* (*100*), (1975), 645—652. (Original paper.)

The paper presents some new generalizations of the H- and K-theorems for surfaces of E^3.

ALOIS ŠVEC, Praha: *On a partial complex structure.* Czech. Math. J. *25* (*100*), (1975), 653—660. (Original paper.)

The paper contains a solution of the equivalence problem for real hypersurfaces of $\mathscr{C}^2$ with respect to the pseudogroup of biholomorphic mappings.

ALOIS ŠVEC, Praha: *On 3-dimensional Lie algebras of vector fields.* Czech. Math. J. *25* (*100*), (1975), 661—672. (Original paper.)

The paper contains a detailed study of the group of automorphisms of a 3-dimensional Lie algebra of vector fields on M^3.