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# Summaries of Papers Appearing in this Issue

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## SUMMARIES OF PAPERS APPEARING IN THIS ISSUE

(These summaries may be reproduced)

CARMEN MARÍA IEŞAN, Iaşi: *Existence theorem in the linear theory of multipolar elasticity.* Apl. mat. 18 (1973), 385—390. (Original paper.)

This paper is concerned with the mixed boundary-value problem, in the linear elasticity of multipolar bodies, using some results from the theory of linear elliptic partial differential equations. The $V$-ellipticity for the corresponding bilinear form of internal energy is derived and the existence, uniqueness and continuous dependence of the solution on the given data is established.

EVŽEN KINDLER, Praha: *A heuristical algorithm for simple exponential analysis.* Apl. mat. 18 (1973), 391—398. (Original paper.)

An algorithm is presented in ALGOL 60 which automatizes the heuristical work of an investigator determining graphically properties of sums of exponential functions. The algorithm processes a set of experimental points so that it approximates them by a sum of positive decreasing exponential functions. It determines not only the parameters of them (i.e. both the coefficients in the exponents and the multiplicative ones which form the linear combination) but also the number of exponential functions, which is in a certain sense optimal with regard to the dispersion of the input values.

MILAN PRÁGER, JIŘÍ TAUFER and EMIL VITÁSEK, Praha: *Overimplicit multistep methods.* Apl. mat. 18 (1973), 399—421. (Original paper.)

The paper is concerned with the numerical solution of ordinary differential equations by a new class of methods called overimplicit multistep methods. The effort is devoted to the study of the convergence and $A$-stability of the introduced methods. $A$-stable formulae of arbitrarily high orders are shown to exist in this new class. This implies the efficiency of using these methods for stiff problems.

VLADIMÍR JANOVSKÝ, Praha: *Elliptic boundary value problems with non-variational perturbation and the finite element method.* Apl. mat. 18 (1973), 422—433. (Original paper.)

This article deals with the estimate of exactness of finite element method which is applied to homogeneous non-eliptic boundary value problem. It is supposed that the respective differential operator of the problem is a sum of elliptic and a "perturbed" operator. A sufficient condition for this "perturbed" operator is given in order that the convergency of finite element method may be maintained.

IVAN HLAVÁČEK, Praha: *On a conjugate semi-variational method for parabolic equations.* Apl. mat. 18 (1973), 434—444. (Original paper.)

Initial-boundary value problems for parabolic equations of the second order can be formulated, like the elliptic problems, also by means of conjugate variables, i.e. in terms of the cogradient vector function.

The conjugate problem is shown to belong to a class of abstract parabolic equations with two positive operators, which have been analysed in a previous author's paper. The first and second semi-variational approximations to the solution of the conjugate problem are presented together with some error estimates.

KAREL DRÁBEK, Praha: *Kurven, welche mit den Geschwindigkeiten der n-dimensionalen Euklidischen Bewegung des starren Systems verbunden sind.* Apl. mat. 18 (1973), 445—451. (Originalartikel.)

In der Arbeit sind in der Phase die Punkte des Gangraumes des $n$-dimensionalen Euklidischen Raumes ausgesucht, welche in der gegeben Bewegung die Eigenschaft haben, daß ihre $l$-ten Geschwindigkeiten mit der Verbindungsgeraden dieser Punkte mit vorerst fest gewählten Punkten des Gangraumes kollinear sind. Diese Punkte liegen allgemein auf einer algebraischen Kurve $n$-ten Grades. Für diese wurden dann $(n/2)$ Hyperquadriken, welche diese Kurve enthalten, bestimmt. Speziell wird der Fall $l = 1$ behandelt und es wird gezeigt, daß man zwischen der geraden und ungeraden Dimension des Raumes unterscheiden muß.

MIROSLAV ŠISLER, Praha: *Über die Konvergenz eines zweiparametrigen Iterationsverfahrens.* Apl. mat. 18 (1973), 452—461. (Originalartikel.)

In der Arbeit untersucht man den Konvergenzbereich eines gewissen zweiparametrigen Iterationsverfahrens für die Lösung eines linearen Gleichungssystems mit einer zyklischen Matrix. Die Ergebnisse der Arbeit kann man auf verschiedene übliche Iterationsmethoden (wie z. B. Jacobi-Verfahren, Gauss-Seidelsches Verfahren, Oberrelaxations-Verfahren u. a.) anwenden.