Aplikace matematiky

Summaries of Papers Appearing in this Issue

Aplikace matematiky, Vol. 19 (1974), No. 2, (138a)

Persistent URL: http://dml.cz/dmlcz/103522

SUMMARIES OF PAPERS APPEARING IN THIS ISSUE

(These summaries may be reproduced)

OLDŘICH JOHN, Praha: *On the solution of the displacement boundary-value problem for elastic-inelastic materials.* Apl. mat. 19 (1974), 61—71. (Original paper.)

The system of equations which describe the model with the so-called internal state variables in continuum mechanics is studied. A theorem asserting the existence and uniqueness of a solution of the displacement boundary-value problem is proved by combining the theory of monotone operators and the Banach contraction principle.

JAN ZÍTKO, Praha: *Extrapolation of S.O.R. iterations.* Apl. mat. 19 (1974), 72—89. (Original paper.)

In the paper, the system of n linear algebraic equations $A\mathbf{x} = \mathbf{b}$ with 2-cyclic matrix is considered. Methods are derived which converge to the solution $\mathbf{x}$ faster than the optimal successive overrelaxation iterative method.

FRANTIŠEK ZÍTEK, Praha: *Die gemischte Warteordnung in Bedienungssystemen mit beschränktem Warteraum.* Apl. mat. 19 (1974), 90—109. (Originalartikel.)

Es wird ein Bedienungssystem des Typs $M/M/1$ im Gleichgewicht untersucht, in dem sich die eintreffenden Kunden in die Warteschlange am Anfang sowie am Ende einreihen können. Die Schlangenlänge ist dabei beschränkt, so daß auch Kundenverluste (gleich beim Eintreffen oder erst nach einem erfolglosen Warten) vorkommen. Die Verlustwahrscheinlichkeiten, die Wartezeitverteilung und die Verteilung der Anzahl der Kundenüberholungen werden aufgefunden.

KAREL REKTORYS, VÁCLAV ZAHRADNÍK, Praha: *Solution of the first biharmonic problem by the method of least squares on the boundary.* Apl. mat. 19 (1974), 110—131. (Original paper.)

Some problems of plane elasticity lead to the solution of biharmonic problem. Many methods have been developped to the solution of this problem (the method of finite differences, the finite element method, classical variational methods, methods based on the theory of functions of a complex variable, etc.). In this paper, the method of least squares on the boundary is presented, having its specific preferences. In the first part, the algorithm of this method and a numerical example are given. This part is mainly intended for "consumers" of mathematics and is written in more detail. In the second part, the proof of convergence of the method is given. This part is mainly intended for mathematicians.

Applied to the solution of the biharmonic problem, the method takes an essential use of the form of equation. As to its idea itself, it can be applied — in proper modifications — also to the solution of other problems.