Summaries of Papers Appearing in this Issue

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(These summaries may be reproduced)

ADOLF KARGER, Praha: *Grundlagen der räumlichen kinematischen Geometrie I.* Apl. mat. 14 (1969), 87–93. (Originalartikel).

Im Artikel sind mit Hilfe der Lieschen Gruppen und Algebren die Eigenschaften und Invarianten der räumlichen Bewegung gefunden.

PRASANTA KUMAR CHAUDHURI, India: *Infinite strip in plane theory of elasticity.* Apl. mat. 14 (1969), 94–104. (Original paper.)

Infinite strip problem in plane theory of elasticity has been developed here by using analytic continuation.

HANA KAMASOVÁ, ANTONÍN ŠIMEK, Praha: *Metoda inverze matice rozdělené na bloky* (A method of inversion of a partitioned matrix.) Apl. mat.14 (1969), 105–114. (Original paper.)

In this paper the problem of the inversion of a block matrix is considered. Formulas for the blocks of the inverse matrix are derived and conditions are given under which these formulas can be used.

BOHUMIL VYBÍRAL, Vyškov: *Lösung einiger Integrale in der relativistischen Physik.* Apl. mat. 14 (1969), 115–119. (Originalartikel.)

In der Arbeit wird gezeigt, dass die Lösung des Integrals $I_m = \int_0^{\pi/2} (\sin^n x : : \sqrt{(1 - \beta^2 \sin^2 x)})\, dx$, $m = 0, 1, 2, \ldots$, wo $\beta = v/c < 1$ das Verhältnis der Geschwindigkeit des Objekts, bzw. seines Teiles, zur Geschwindigkeit des Lichtes ist, für $\beta^2 \to 1$ auf die Lösung des Integrals $I'_m = \int_0^{x_1} (\sin^n x/\cos x)\, dx$ überleitbar ist, wo $x_1 = \arccos \frac{1}{2} \sqrt{(1 - \beta^2)}$. In der Arbeit ist die Lösung des Integrals für $m = 0, 1, 2n$ und $2n + 1$ gegeben, wo $n = 1, 2, 3, \ldots$ Für die Beurteilung der Genauigkeit der approximativen Lösung ist der numerische relative Fehler $\delta_r = ((I_m - I'_m)/I_m)\, 100\%$ in der Abhängigkeit auf β^2 für $m \in [0, 8]$ ausgewertet.

JOSEF HOJDAR, Praha: *Eigenwertabschätzungen für ein Polynomialproblem.* Apl. mat. 14 (1969), 120–133. (Originalartikel.)

Im Artikel ist eine Abschätzung für das Polynomialproblem $(\lambda^r A_0 + + \lambda^{r-1} A_1 + \ldots + A_r)\, x = o$ angeführt, wo $A_0, A_1, \ldots, A_r$ quadratische Matrizen sind. Im Falle $r = 1$, $A_0 = E$ stellt diese Abschatzung die Gerschgorinabschätzung für Eigenwerte einer Matrix dar.

OTTO VEJVODA, Praha: *Periodic solutions of weakly nonlinear wave equation in E_3 in a spherically symmetrical case.* Apl. mat. 14 (1969), 160–167. (Original paper.)

In the paper the conditions for the existence of a 2π-periodic solution in t of the system $u_{tt} - u_{rr} - (2/r)\, u_r = \varepsilon f(t, r, u, u_t, u_r)$, $|u(t, 0)| < +\infty$, $u(t, \pi) = 0$ are investigated provided that f is sufficiently smooth and 2π-periodic in t.

ROSTISLAV ZEZULA, Praha: *A sufficient condition for flattening of the thermal neutron flux and some related problems (in onedimensional geometries)*. Apl. mat. 14 (1969), 134—145. (Original paper.)

The main results of this paper, in which the problem of determination of the fuel concentration distribution M inducing a prescribed thermal neutron flux Φ in the homogenized critical reactor core with given outer reflector boundary is investigated (in the two-groups diffusion approximation), are stated in the theorems 1 and 2. In Theorem 1 sufficient conditions are given for the existence of a oneparametrical family of thermal neutron fluxes induced by the Goertzel's type fuel concentration distribution. This theorem enables us to seek for the flux of this oneparametrical family which gives the maximal total output of the reactor. In Theorem 2 the results of Theorem 1 are generalized for the case of such fuel concentration distributions which are not of the Goertzel's type.

IVO MAREK, Praha: *On the polynomial eigenvalue problem with positive operators and location of the spectral radius.* Apl. mat. 14 (1969), 146—159. (Original paper).

The purpose of this article is to give some estimates for the spectral radius of the polynomial eigenvalue problem, i.e. to derive some estimates for the singularity of the operator-function F, $F(\lambda) = \lambda^m A_0 - \sum_{k=1}^{m} \lambda^{m-k} A_k$ with the maximal absolute value. It is assumed that $A_1, \ldots, A_m, A_0^{-1}$ are bounded linear operators mapping a Banach space $\mathscr{Y}$ into itself. Further, it is assumed that the operators B_j, where $B_j = A_0^{-1} A_j$, $j = 1, 2, \ldots, m$, leave a cone $\mathscr{K} \subset \mathscr{Y}$ invariant.