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MECHANICS AND MATHEMATICS OF NAS OF UKRAINE
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IVAN FRANKO LVIV NATIONAL UNIVERSITY
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WESTERN SCIENTIFIC CENTER OF NAS AND MES OF UKRAINE



**XI INTERNATIONAL SKOROBOHATKO
MATHEMATICAL CONFERENCE**

(October 26 – 30, 2020, Lviv, Ukraine)

ABSTRACTS

Lviv – 2020

Abstracts of XI International V.Skorobohatko Mathematical Conference are published. The new results in a few branches of mathematics relevant to interests of Prof. Vitaliy Skorobohatko (1927-1996) are presented. Tasks in the fields of ordinary differential equations and differential equations with partial derivatives are considered, problems in function theory, functional analysis, algebra and computational mathematics are analyzed. A number of applications to problems in mathematical physics and mechanics are developed.

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Approved for publication by the Academic Council of Pidstryhach Institute for Applied Problems of Mechanics and Mathematics, National Academy of Sciences, Ukraine (prot. 7, 1.10.2020)

First page: portrait of V.Skorobohatko

ISBN 978-966-02-9390-8 (electronic publication)

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for Applied Problems
of Mechanics and Mathematics

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ON THE CONVERGENCE OF MULTIDIMENSIONAL S-FRACTIONS WITH INDEPENDENT VARIABLES

Let

$$1 + \prod_{k=1}^{\infty} \sum_{i_k=1}^{i_{k-1}} \frac{c_{i(k)} z_{i_k}}{1}, \quad (1)$$

where $z_{i_k} \in \mathbb{C}$, $i_k = 1, 2, \dots, N$; $c_{i(k)} > 0$, $i(k) \in \mathcal{I}$,

$$\mathcal{I} = \{i(k) = (i_1, i_2, \dots, i_k) : 1 \leq i_k \leq i_{k-1} \leq \dots \leq i_0; k \geq 1; i_0 = N\},$$

be a multidimensional S -fraction with independent variables, N is a fixed natural number.

Theorem. *Let the elements of a BCF (1) satisfy the conditions*

$$c_{i(k)} \leq c, \quad i(k) \in \mathcal{I}.$$

Then the multidimensional S -fraction with independent variables (1) converges uniformly on every compact subset K of

$$D = \left\{ \mathbf{z} \in \mathbb{C}^N \setminus \{0\} : -\frac{\pi}{2} < \arg z_N \leq \arg z_{N-1} \leq \dots \leq \arg z_1 < 0 \right\}$$

to a holomorphic function in D and the following truncation error bound holds

$$|f_m(\mathbf{z}) - f_{Nn}(\mathbf{z})| < D_N \left(\frac{\sqrt{\delta^2 + 4M} - \delta}{\sqrt{\delta^2 + 4M} + \delta} \right)^n, \quad m \geq Nn, \quad n \geq 1,$$

where $M = c \max_{\mathbf{z} \in K, 1 \leq m \leq N} |z_m|$, $\delta = \cos \left(\max_{\mathbf{z} \in K} |\arg z_N| \right)$,

$$D_1 = 2M/\delta, \quad D_r = 4(D_{r-1}S + M/\delta), \quad r = 2, \dots, N,$$

$$S = 1 + M\sqrt{M^2 + \delta^4} / \left(\delta^2 \left(\sqrt{M^2 + \delta^4} - M \right) \right).$$

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