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ON THE UNIFORM CONVERGENCE OF MULTIPLE POWER SERIES ON THE DISTINGUISHED BOUNDARY

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Abstract. The sufficient condition is found for the multiple power series of the function, analytic in Δ_s and continuous on $\Delta_s \bigcup \Gamma_s$ $(s \geq 1)$ to be uniformly convergent on $\bar{\Delta}_s$.

Keywords and phrases: Multiple power series, analytic functions, uniform convergence.

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Let C^s be a s- dimensional space of complex numbers, $Z = (Z_1, \cdots, Z_s)$, $Z_k = r_k e^{it_k}$, $r_k \geq 0$, $t_k \in [-\pi, \pi]$, $k = 1, \cdots, s$,

$$\Delta_s = \{Z_k : \ |Z_k| < 1, \ k = 1, \cdots, s\}$$

$$\bar{\Delta}_s = \{Z_k : \ |Z_k| \leq 1, \ k = 1, 2, \cdots, s\}$$

$$\Gamma_s = \{Z_k : \ |Z_k| = 1, \ k = 1, \cdots, s\}$$

Denote by $A(\Delta_s \bigcup \Gamma_s)$ the space of functions of s complex variables, that are analytic on Δ_s and continuous on $\Delta_S \bigcup \Gamma_s$. Let $\bar{Q}_j$, $j = 1, 2, 3, 4$ denote the closed quadrants of the plane C.

The following theorem holds.

Theorem. *Let $f \in A(\Delta_s \bigcup \Gamma_s)$ and let*

$$\sum_{k=0}^{\infty} C_k(f) Z^k \tag{1}$$

be its s dimensional power series. If for some $j \in \{1, 2, 3, 4\}$

$$C_k(f) \in \bar{Q}_j, \quad k = 0, 1, \cdots$$

then series (1) uniformly converges to the function f on Γ_s.

This theorem is new in a one-dimensional case too.

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