

**CONVERGENCE AND STABILITY TO PERTURBATIONS FOR  
EXPANSIONS OF SOME SPECIAL FUNCTIONS INTO  
BRANCHED CONTINUED FRACTIONS**

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We present multidimensional generalizations of continued fractions – branched continued fractions (BCF). The properties of convergence and stability to perturbations for some type of functional branched continued fractions are studied [1].

It is known that continued fractions give simple expansions for hypergeometric functions or their ratio [4]. We use BCF to construct rational approximations for hypergeometric functions of several variables [3, 2]. Also we prove that the Nörlund branched continued fractions with conditions for parameters

$$a, b_1, b_2 \geq 0, \quad 2\Re(c) \leq a + b_1 + b_2 + 1$$

converges to function

$$\frac{c - a - b_1 - b_2 - 1}{c} \cdot \frac{F_1(a, b_1, b_2; a + b_1 + b_2 + 1 - c; 1 - z_1, 1 - z_2)}{F_1(a + 1, b_1 + 1, b_2; a + b_1 + b_2 + 2 - c; 1 - z_1, 1 - z_2)}$$

in domain

$$\{(z_1, z_2) \in \mathbb{C}^2 : \Re(z_i) > \frac{1}{2}, i = 1, 2\}.$$

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