Abstract

Let the differential system

\[ z^p \frac{df(z)}{dz} = A(z) \cdot f(z), \quad f(z) = (f_1(z), f_2(z), ..., f_k(z)) \] (1)

where \( D \) is the diagonal matrix \( p, p, ..., p \geq 2, p \in \mathbb{N} \) and the elements \( \alpha_{ij}(z) \) of the matrix \( A(z) \) are analytic functions in some neighborhood of the closed unit disc. In this paper under several assumptions with respect to the constant matrices \( \{\alpha_{ij}(0)\}, \{\alpha'_{ij}(0)\}, i, j = 1, 2, ..., k \) and the diagonal \( D \), it is proved that the conjugate system of (1) has exactly \( k(p - 1) \) linearly independent solutions in the product space \( H_2(\Delta)^k \), where \( H_2(\Delta) \) is the usual Hilbert space of analytic functions in the open unit disc.