SOME PROPERTIES OF MEREMORPHIC SOLUTIONS OF LINEAR DIFFERENTIAL EQUATION WITH MEROMORPHIC COEFFICIENTS

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Let M be the field of meromorphic in £ functions. Consider the equation

$$f^{(n)} + a_{n-1} f^{(n-1)} + a_{s+1} f^{(s+1)} + \mathbf{K} + a_0 f = 0, \qquad (1)$$

$a_j \in M,\ j = 0,1,\mathbf{K},n-1.$ Growth rate of $f \in M$ is described by Nevanlinna's characteristics $m(r, f), T(r, f)$ [1, p. 24-27]; remind

$$m(r, f) = \frac{1}{2p} \int_0^{2p} \ln^+ \left| f\left(re^{ij}\right) \right| dj,\ \ \ln^+ x \overset{def}{=} \max\left(\ln x, 0\right),\ \ x \geq 0.$$

The function $f \in M$ has a finite order of growth $r[f]$, if

$$r[f] = \overline{\lim_{r \to \infty}} \frac{\ln T(r, f)}{\ln r} < +\infty.$$

The followingTheorem has been proven.

Theorem. *Let the differential equation (1) be given. Then if the coefficients* $a_j \in M,\ j = 0,1,\mathbf{K},n-1$ *of the equation (1) are such that:*

1) $m(r, a_j) = O(1),\ j = s+1, s+2, \mathbf{K}, n-1,\ m(r, a_s) \neq O(1),$

then the equation (1) can have no more than s linearly independent solutions $f \in M$ *of order* $r < 1$;

2) $m(r, a_{s+1}),\ m(r, a_{s+2}),\ \mathbf{K},\ m(r, a_{n-1}) = o(m(r, a_s)),\ r \overline{\in} E,\ mesE < \infty,$

then the equation (1) can have no more than s linearly independent solutions $f \in M$*, the growth rate of which is limited by the rate of growth of coefficients.*

1. A. A. Goldberg and I. V. Ostrovskiy, *Raspredelenie znacheniy meromorfnyih funktsiy*, Nauka, Moskwa, 1970.