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ON THE GROWTH OF NON-ADMISSIBLE SOLUTIONS OF THE DIFFERENTIAL EQUATION $(w')^n=\sum_{j=0}^{m} a_j w^j$

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1. Introduction.

Let $a_0, \cdots, a_m$ be meromorphic in the complex plane and $a_m \neq 0$. We consider the differential equation

$$(w')^n=\sum_{j=0}^{m} a_j w^j \qquad (m \geqq 1). \tag{1}$$

It is said ([1]) that any meromorphic solution $w(z)$ of (1) in the complex plane is admissible when it satisfies the condition

$$T(r, a_j)=o(T(r, w)) \qquad (j=0, 1, \cdots, m)$$

for $r \to \infty$ possibly outside a set of r of finite linear measure.

In this paper we will denote by E any set of r of finite linear measure and the term "meromorphic" will mean meromorphic in the complex plane.

A few years ago, Gackstatter and Laine ([1], 3) investigated the differential equation (1) in many cases. One of their results is

THEOREM A. *When $m-n=k \geqq 1$ and k is not a divisor of n, the differential equation* (1) *does not have any admissible solutions.*

It is well-known that this theorem is true when $k \geqq n+1$.

They also gave the conjecture that, when $1 \leqq m \leqq n-1$, the differential equation (1) does not possess any admissible solutions. With respect to this conjecture, we have recently proved the following theorems in [7].

THEOREM B. *When $1 \leqq m \leqq n-1$, the differential equation* (1) *has no admissible solutions, except when n-m is a divisor of n and* (1) *has the form*:

$$(w')^n=a_m(w+\alpha)^m \qquad (\alpha: \textit{constant}).$$

THEOREM C. *When $1 \leqq m \leqq n-1$, any meromorphic solution of the differential equation* (1) *is of order at most ρ, where $\rho=\max(\rho_0, \cdots, \rho_m)$, ρ_j=the order of $a_j<\infty$.*

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