

SOME RESULTS OF HIGHER ORDER LINEAR DIFFERENTIAL EQUATIONS

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Abstract. In this paper, we investigate the growth properties of solutions and the existence of subnormal solutions for a class of higher linear differential equations, and obtain several results which improve and extend some results of Chen, Hamouda and Belaïdi.

Keywords. Differential equation, entire functions, subnormal solution, growth .

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1 Introduction

In this paper a meromorphic function will mean meromorphic in the whole complex plane, and we assume that the reader is familiar with standard symbols and fundamental results of Nevanlinna Theory ^[13], we denote $\sigma(f)$ by the order of growth of $f(z)$. In order to investigate the growth of meromorphic functions of infinite order, we need the following definitions ^[8].

Definition 1.1 Let $f(z)$ be a meromorphic function, the hyper-order of $f(z)$, denoted by $\sigma_2(f)$, is defined by

$$\sigma_2(f) = \limsup_{r \rightarrow \infty} \frac{\log \log T(r, f)}{\log r}.$$

Definition 1.2 Let $f(z) \not\equiv 0$ be a solution of the equation

$$f^{(n)} + a_{n-1}(z)f^{(n-1)} + \cdots + a_0(z)f = a(z)$$

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