

Wang, Jun; Lü, Weiran

The fixed points and hyper-order of solutions of second order linear differential equations with meromorphic coefficients. (Chinese. English summary) Zbl 1064.30025

Acta Math. Appl. Sin. 27, No. 1, 72-80 (2004).

Let z_1, z_2, \dots ($r_i = |z_i|$, $0 < r_1 \leq r_2 \leq \dots$) be the fixed points of a transcendental meromorphic function f . Define

$$\tau(f) = \inf \left\{ \tau > 0, \sum_{i=1}^{\infty} r_i^{-\tau} < \infty \right\}$$

and the index of fixed points of f as

$$\tau_2(f) = \lim_{r \rightarrow \infty} \frac{\log \log \bar{N}(r, \frac{1}{f-z})}{\log r}.$$

The authors study the index of fixed points for a nonzero meromorphic function which is a solution of a complex second order differential equation. For example, the authors show that suppose $A(z)$ is a transcendental meromorphic function with $\delta(\infty, A) > 0$ then any non-zero solution $f(z)$ of the second order complex differential equation $f'' + A(z)f = 0$ and f', f'' have infinite fixed points and their indexes satisfy $\tau(f) = \tau(f') = \tau(f'') = \infty$ and $\tau_2(f) = \tau_2(f') = \tau_2(f'') = \sigma_2(f)$, where $\sigma_2(f)$ is the hyperorder of f . The similar results are also investigated for some other type of second order complex differential equations.

Reviewer: [Hasi Wulan \(Shantou\)](#)

MSC:

- 30D35** Value distribution of meromorphic functions of one complex variable, Nevanlinna theory
- 30D05** Functional equations in the complex plane, iteration and composition of analytic functions of one complex variable

Cited in 7 Documents

Keywords:

[second order differential equation](#); [meromorphic function](#); [fixed point](#); [hyperorder](#)