Belaïdi, Benharrat; **el Farissi, Abdallah**
Differential polynomials generated by some complex linear differential equations with meromorphic coefficients. (English) Zbl 1166.34054
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Let M be the field of meromorphic functions in C. Consider the second order differential equation

$$y'' + A_1(z)\exp(P(z))y' + A_0(z)\exp(Q(z))y = 0, \tag{1}$$

where A_1, $A_0 \in M$, P, $Q \in C[z]$. The authors study properties of meromorphic solutions of equation (1) and prove the following theorem.

Theorem: Let $P(z) = \sum_{i=0}^{n} a_i z^i$ and $Q(z) = \sum_{i=0}^{n} b_i z^i$ be nonconstant polynomials, where a_i, $b_i \in C\,(i = 0, \dots, n), a_n b_n \neq 0$ such that $\arg a_n \neq \arg b_n$ or $a_n = cb_n (0 < c < 1)$ and $A_1(z)$, $A_0(z)\,(\neq 0)$ be meromorphic functions with $\rho(A_j) < n\,(j = 0, 1)$. Let $d_0, d_1, d_2 \in M$ that are not all equal to zero with $\rho(d_j) < n\,(j = 0, 1, 2), \varphi \in M^*$ has finite order. If $f \in M^*$ is a solution of (1), then the differential polynomial $g = d_2 f'' + d_1 f' + d_0 f$ satisfies $\bar{\lambda}(g - \varphi) = \infty$, where $\bar{\lambda}(f)$ denotes the exponents of covergence of the sequence of distinct zeros of f.

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34M10 Oscillation, growth of solutions to ordinary differential equations in the complex domain

30D35 Value distribution of meromorphic functions of one complex variable, Nevanlinna theory

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