
Galina Filipuk and Rodney G. Halburd

Movable Singularities of Equations of Liénard Type

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Abstract. The movable singularities of solutions of equations of the form $y'' = F(z, y)y' + G(z, y)$ are studied, where F and G are polynomials in y . It is shown that if $\deg_y G \leq \deg_y F + 1$ and a certain resonance condition is satisfied, then any movable singularity of y that can be reached by analytic continuation along a finite length curve is algebraic. The case in which $\deg_y G \leq \deg_y F - 1$ and the only explicit dependence on z in the equation is in the y -independent term of $G(z, y)$ was considered by R. Smith. The movable algebraic and non-algebraic singularities in a particular class of equations of Liénard type satisfying the “maximum balance” condition $\deg_y G = 2 \deg_y F + 1$ are also analyzed.

Keywords. Algebraic singularities, movable singularities, Liénard equations.

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