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Asymptotic behaviors of solutions of some two order linear ordinary differential equations with variable coefficients. (Chinese. English summary) [Zbl 1463.34039](#)

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Summary: The mathematical model of a class of second-order linear homogeneous ordinary differential equations with variable coefficients is investigated. By using the undetermined coefficient method of power series, the general form of power series solution is obtained. Under special conditions, by the transformation of the functions, the analytic solutions with the form of elementary function is obtained via the method of separation of variables. In addition, the asymptotic behaviors of the solution in this case are analyzed. The asymptotic properties of this problem are carried out by using Lyapunov method. The convergence of solution is given under some conditions. The asymptotic convergence under some special conditions is consistent with the practice problems, which shows that the mathematical model has certain practical significance in application.

MSC:

[34A30](#) Linear ordinary differential equations and systems

[34D05](#) Asymptotic properties of solutions to ordinary differential equations

[34A25](#) Analytical theory of ordinary differential equations: series, transformations, transforms, operational calculus, etc.

Keywords:

ordinary differential equations with variable coefficients; power series; Lyapunov method; asymptotic analysis