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**Monodromy preserving deformation of linear ordinary differential equations with rational coefficients. I: General theory and  $\tau$ -function.** (English) Zbl 1194.34167

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Summary: A general theory of monodromy preserving deformation is developed for a system of linear ordinary differential equations  $dY/dx = A(x)Y$ , where  $A(x)$  is a rational matrix. The non-linear deformation equations are derived and their complete integrability is proved. An explicit formula is found for a 1-form  $\omega$ , expressed rationally in terms of the coefficients of  $A(x)$ , that has the property  $d\omega = 0$  for each solution of the deformation equations. Examples corresponding to the “soliton” and “rational” solutions are discussed.

**MSC:**

- 34M35** Singularities, monodromy and local behavior of solutions to ordinary differential equations in the complex domain, normal forms
- 34A30** Linear ordinary differential equations and systems

Cited in **11** Reviews  
Cited in **240** Documents

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