

Darboux Transformations for Integrable Systems

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Abstract

In 1882, the French mathematician Jean Gaston Darboux introduced a method to solve the Sturm-Louville equation, which is called Darboux Transformation afterwards. Darboux transformation is a simultaneous mapping between solutions and coefficients of a pair of equations of the same form. It may be formulated as a covariance principle for the corresponding operators, i.e. the order and form of the operators are saved after the transformation. Almost a century later, in 1979, Matveev realised that the method given by Darboux for the spectral problem of second order ordinary differential equations can be extended to some important soliton equations. Darboux transformations are an important tool for studying the solutions of integrable systems. They provide a universal algorithmic procedure to derive explicit exact solutions of integrable systems. The goal of this talk is to explain the basic ideas of Darboux transformations for integrable systems.

References

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