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**Applications of Bell-polynomial scheme in constructing the conversation laws of the non-linear evolution equations admitting two-field bilinear forms.** (English) [Zbl 1394.35422](#)

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Summary: The Bell-polynomial scheme is applied to obtain the infinite conservation laws for the nonlinear evolution equations (NLEEs) admitting two-field bilinear forms. Bell-polynomial scheme has been used to obtain certain bilinear Bäcklund transformations (BTs), Lax pairs and infinite conservation laws for the NLEEs with one-field bilinear forms. Based on the two-field bilinear forms and four-field bilinear BTs in the binary-Bell-polynomial form, the infinite conversation laws for a variable-coefficient modified Korteweg-de Vries equation arising in fluid and plasma physics as well as the Boussinesq-Burgers equations for the shallow water waves are construed systematically. Such procedure can be applied to other NLEEs admitting two-field bilinear forms.

**MSC:**

**35Q53** KdV equations (Korteweg-de Vries equations)

**37K35** Lie-Bäcklund and other transformations for infinite-dimensional Hamiltonian and Lagrangian systems

**33C80** Connections of hypergeometric functions with groups and algebras, and related topics

**35A30** Geometric theory, characteristics, transformations in context of PDEs