Multi-component SC Lax Integrable Hierarchy of Soliton Equations and Its Multi-component Integrable Coupling System with Two Arbitrary Functions

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Abstract: A new simple loop algebra $\tilde{G}_M$ is constructed, which is devoted to establishing an isospectral problem. By making use of generalized Tu scheme, the multi-component SC hierarchy is obtained. Furthermore, an expanding loop algebra $\tilde{F}_M$ of the loop algebra $\tilde{G}_M$ is presented. Based on $\tilde{F}_M$, the multi-component integrable coupling system of the multi-component SC hierarchy of soliton equations is worked out. How to design isospectral problem of mulit-component hierarchy of soliton equations is a technique and interesting topic. The method can be applied to other nonlinear evolution equations hierarchy.

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