A Multi-component Matrix Loop Algebra and Its Application

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Abstract: A set of multi-component matrix Lie algebra is constructed. It follows that a type of new loop algebra $\tilde A_{M-1}$ is presented. An isospectral problem is established. Integrable multi-component hierarchy is obtained by Tu pattern, which possesses tri-Hamiltonian structures. Furthermore, it can be reduced to the well-known AKNS hierarchy and BPT hierarchy. Therefore, the major result of this paper can be regarded as a unified expression integrable model of the AKNS hierarchy and the BPT hierarchy.

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