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两个高维loop代数及应用

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摘要 借助于循环数, 构造了维数分别是 $5(s+1)$ 和 $4(s+1)$ 的两个高维loop代数. 为了计算方便, 本文只考虑 $s=1$ 时的应用. 利用第一个loop代数 \tilde{A}^*_1 得到了具有 4 -Hamilton结构的一个广义AKNS族, 该方程族可约化为著名的AKNS族. 利用第二个loop代数 \tilde{A}^*_2 , 得到了具有4个分量位势函数的 4 -Hamilton结构方程族, 该族可约化为一个非线性耦合Burgers方程和一个耦合的KdV方程.

关键词 [循环数](#) [loop代数](#) [Hamilton结构](#)

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Two High-dimensional Loop Algebras and Their Applications

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Abstract With the help of the cycled numbers, two higher-dimensional loop algebras are constructed, whose dimension numbers are $5(s+1)$ and $4(s+1)$, respectively. For the sake of simple calculation, we only take $s=1$ in the paper for illustrating their applications. By employing the first loop algebra \tilde{A}^*_1 , a generalized AKNS hierarchy is obtained, possessing 4-Hamiltonian structure, which is also reduced to the well-known AKNS hierarchy. By making use of the second loop algebra \tilde{A}^*_2 , a new integrable hierarchy with 4-potential functions is generated, also possessing 4-Hamiltonian structure, which is reduced to a nonlinear coupled Burgers equation and a coupled KdV equation, respectively.

Key words [cycled number](#) [loop algebra](#) [Hamiltonian structure](#)

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