Abstract

For an abelian group S, we introduce an infinite-dimensional Lie algebra D_S. Indeed, If S is the additive group of integers, D_S reduces to the q-Virasoro algebra D_q introduced by Belov and Chaltikian in the studying of lattice conformal theories .

By applying the theory of vertex algebras, we prove that D_S is isomorphic to the S-covariant algebra of a certain affine Lie algebra, and establish the relationship between the q-Virasoro algebra D_q and affine Kac-Moody Lie algebras. More specifically, we show that if S is a finite abelian group of order 2n+1, D_S is isomorphic to the affine Kac-Moody algebra of type B.