

Affine Weyl groups in K -theory and representation theory

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102 Bradley Hall, 4:00 pm
(Tea 3:30 pm Math Lounge)

Abstract

We present a simple combinatorial model for the characters of the irreducible representations of complex semisimple Lie groups and, more generally, for Demazure characters. On the other hand, we give an explicit combinatorial Chevalley-type formula for the T -equivariant K -theory of generalized flag manifolds G/B . The construction is given in terms of alcove paths, which correspond to decompositions of affine Weyl group elements, and saturated chains in the Bruhat order on the (nonaffine) Weyl group. A key ingredient is a certain R -matrix, that is, a collection of operators satisfying the Yang-Baxter equation. Our model has several advantages over the Littelmann path model and a more recent model of Gaussent and Littelmann. This is a joint work with Alexander Postnikov from MIT. Most of the mathematical background will be reviewed; examples will be used to illustrate the structures involved and our main construction.