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**Homological realization of restricted Kostka polynomials.** (English) [Zbl 1162.17313](#)  
[Int. Math. Res. Not.](#) 2005, No. 33, 1997-2029 (2005).

Summary: We give two realizations of restricted Kostka polynomials for  $\mathfrak{sl}_2$ . Firstly we identify restricted Kostka polynomials with characters of the zero homology of the current algebra with coefficients in the certain modules. As a corollary we reobtain the alternating sum formula. Secondly we show that restricted Kostka polynomials are  $q$ -multiplicities of the decomposition of the certain integrable  $\widehat{\mathfrak{sl}}_2$ -modules to the irreducible components. This allows to write a kind of fermionic formula for the Virasoro unitary characters.

**MSC:**

[17B67](#) Kac-Moody (super)algebras; extended affine Lie algebras; toroidal Lie algebras [Cited in 1 Document](#)  
[17B55](#) Homological methods in Lie (super)algebras

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