The q-analog of Kostant’s partition function and the highest root of the simple Lie algebras.

Kostant’s partition function counts the number of ways to represent a particular vector (weight) as a nonnegative integral sum of positive roots of a Lie algebra. For a given weight the q-analog of Kostant’s partition function is a polynomial where the coefficient of $q^k$ is the number of ways the weight can be written as a nonnegative integral sum of exactly $k$ positive roots. In this talk, we present generating functions for the q-analog of Kostant’s partition function when the weight in question is the highest root of the classical Lie algebras of types $B$, $C$, and $D$, and the exceptional Lie algebras of type $G_2$, $F_4$, $E_6$, $E_7$, and $E_8$. (Received September 08, 2016)