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*Growth series of cyclotomic and root lattices.*

Given a set of monoid generators of a lattice, one can define the word length function on the elements of the lattice, and the corresponding generating function also known as the growth series of the lattice. This series is the Hilbert series of a toric algebra. In interesting instances, such as in the case of root lattices $A_n$, $C_n$ and $D_n$ (where the generators are all roots), or for cyclotomic lattices (where the generators are all roots of unity), this algebra is the coordinate ring of a projective toric variety defined by the convex hull of the generators. Methods from toric Groebner bases and Ehrhart theory gives us a unifying approach to compute the growth series of these lattices. (Received March 03, 2009)