1030-05-105 **T. Kyle Petersen*** (`tkpeters@umich.edu`), University of Michigan, Department of Mathematics, 530 Church Street, Ann Arbor, MI 48109. *The Steinberg torus and affine descents.*

One well-known link between combinatorics and geometry is that the classical Eulerian polynomial (i.e., the descent generating function for permutations) is equal to the h-polynomial of the Coxeter complex of type A. Generalizing to any finite Coxeter group W, we have the W-Eulerian polynomials, which are known to be symmetric, unimodal, and for all but type D, real-rooted. (Brenti has conjectured real-rootedness holds for arbitrary W.)

Here we present, for any Weyl group W, the *affine W-Eulerian polynomial*. This polynomial arises as the h-polynomial of the *Steinberg torus*—a simplicial complex obtained by taking the affine Coxeter complex modulo the coroot lattice. The maximal cells of the Steinberg torus correspond to the elements of W, and we show the affine W-Eulerian polynomial can be expressed as a generating function for a descent-like statistic for elements of W. We prove that all affine W-Eulerian polynomials are γ-nonnegative; a property that implies symmetry and unimodality. We also conjecture real-rootedness, proved for all but types B (distinct here from C) and D.

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