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Marcelo Aguiar* (maguiar@math.cornell.edu) and **T Kyle Petersen**. *The Steinberg torus and the Coxeter complex of a Weyl group.*

Given an irreducible crystallographic root system Φ , consider the torus obtained as the quotient of the ambient space by the coroot lattice of Φ . There is a certain cell complex structure on this torus, introduced by Steinberg and studied by Dilks, Petersen, and Stembridge. In joint work with Petersen, we exhibit a module structure on (the set of faces of) this complex over the (set of faces of the) Coxeter complex of Φ . The latter is a monoid under the Tits product of faces. The module structure is obtained from geometric considerations involving affine hyperplane arrangements. As a consequence, we obtain a module structure on the space spanned by affine descent classes of a Weyl group, over the classical descent algebra of Solomon. We provide combinatorial models when Φ is of type A or C . (Received August 12, 2014)