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The Steinberg Torus and the Coxeter Complex of a Weyl Group

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Associated to a root system Φ , there is a torus equipped with a particular triangulation. This was introduced by Steinberg and further studied by Dilks, Petersen, and Stembridge. In joint work with Kyle Petersen, we exhibit a module structure for this complex over the Coxeter complex of Φ . The 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 (picture) when Φ is of type A or C.

The talk will not assume any background in root systems or hyperplane arrangements

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