

The geometry of involutions of algebraic groups and of Kac-Moody groups

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July 1, 2009

Untwisted finite groups of Lie type, reductive algebraic groups and Kac-Moody groups share a unifying feature: They all admit so-called (twin) BN-pairs, which in turn induce a simplicial complex with a natural action by the group, a so-called *(twin) building*. Many important features of groups with BN-pair are reflected in their associated buildings, allowing the application of geometric methods for studying the groups. Indeed buildings have become an important tool in the theory of these classes of groups.

For this talk, let G be a group as listed above with building Δ , and let θ be an involutory automorphism of G , and let $K := \text{Fix}_G(\theta)$. Possibilities for K include twisted groups and unitary forms of algebraic and Kac-Moody groups. In this talk we introduce a geometry Δ^θ (a subcomplex of Δ), the *Phan geometry* with respect to θ . Like buildings, these geometries have many fruitful applications when studying K . Here, we show that this geometry is residually connected under some mild assumptions on G . From this we conclude that K is finitely generated.