

Chow quotients in Kazhdan–Lusztig–Stanley theory

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Classical Kazhdan–Lusztig–Stanley (KLS) theory assigns to a broad class of posets families of left and right KLS polynomials, each indexed by intervals within the poset. Examples of KLS polynomials include Kazhdan–Lusztig polynomials of Coxeter groups, g -polynomials of polytopes as well as Kazhdan–Lusztig polynomials of matroids. Recently, Ferroni, Matherne, and Vecchi introduced a new family of polynomials, called Chow polynomials, which also depend on poset intervals. Remarkably, Chow polynomials are always symmetric.

I my talk I will explain the geometric interpretation of Chow polynomials in terms of Chow quotients of projective varieties by the action of a one-dimensional torus. Motivated by surprising symmetry of Chow polynomials, we show that such Chow quotients are rationally smooth for a large class of actions. As an application, we construct rationally smooth models for Richardson varieties.

Based on joint work in progress with Mateusz Michalek and Botong Wang.