

Student Research Talks (StReeTs)

Mason Experimental Geometry Lab (MEGL)

Orbits, Special Words, and Polytopes

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Abstract

Orbits We are studying the dynamics of the action of outer automorphism group, $Out(F_2)$ of free group on the character variety, $\mathfrak{X}(F_2, SL_2(\mathbb{F}_q))$ for a prime q . One of the ways to understand the dynamics is looking at the growth of the maximum orbit length with the increase in prime q . We will discuss a few observations from the experimental data and some open questions.

Special Words This research is to determine necessary conditions for words of the rank 2 free group to be 3-special with the goal of determining if 3-special words exist at all. Words are 3-special if they are non-conjugate and have the same trace, calculated by replacing each letter with a corresponding matrix from $SL_3\mathbb{C}$. It has been previously proven that a word will never be 3-special with its inverse, and we conjecture that a word will never be 3-special with its reverse and the inverse of its reverse. This research has applications to algebraic geometry.

Polytopes Using Berenstein-Zelevinsky triangles and trivalent graphs, we can construct polyhedral cones representable as semigroup algebras. Being finitely presentable, we encoded the graph and triangle data into a program that gives us the generators of said algebras and relationships among them.

Date: Friday, September 9, 2016

Time: 2:30pm–3:30pm

Place: Exploratory Hall 4106

Pizza and soda will be served at the presentation.

For further information or for special accommodations, please contact Sean Lawton via email at seanlawton@gmail.com or drop by the MEGL.