

Semi-Inverted Linear Spaces

Georgy Scholten

North Carolina State University
gscholt@ncsu.edu
Joint work with Cynthia Vinzant

The image of a linear space under inversion of some coordinates is an affine variety whose structure is governed by an underlying hyperplane arrangement. We generalize work by Proudfoot and Speyer and show that some circuit polynomials form a universal Gröbner basis for the ideal of polynomials vanishing on this variety. The proof relies on degenerations to the Stanley-Reisner ideal of a simplicial complex determined by the underlying matroid. Moreover, if the linear space is real, then the semi-inverted linear space is also an example of a hyperbolic variety, meaning that all of its intersection points with a large family of linear spaces are real.