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Gröbner Cones for Finite Type Cluster Algebras

Cluster algebras are a class of commutative algebras defined by a combinatorial iterative method. Consequently, many properties of cluster algebras may be studied through combinatorial tools. In the case of finite cluster type, the cluster algebra $\mathcal{A}$ is canonically a quotient of a polynomial ring by an ideal $I_{\mathcal{A}}$. By work of Ilten, Nájera-Chávez, and Treffinger, there exists a term order such that the initial ideal of $I_{\mathcal{A}}$ is the ideal generated by products of incompatible cluster variables. We study the Gröbner cone $\mathcal{C}_{\mathcal{A}}$ corresponding to this initial ideal. In joint work with Ilten, we construct distinguished elements of $\mathcal{C}_{\mathcal{A}}$ using compatibility degrees, and give explicit descriptions of the rays and lineality spaces of $\mathcal{C}_{\mathcal{A}}$ in terms of combinatorial models for cluster algebras of types A_n , B_n , C_n , D_n with a special choice of frozen variables, and in the case of no frozen variables. In this talk, I will discuss the main results in types A_n , B_n , and C_n .