The exotic nilCoxeter algebra for $G(m, m, 3)$

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30th Applications of Computer Algebra - ACA 2025

Ben Elias introduced a q-deformation of the Cartan matrix of affine type A_{n-1}, which plays a role in the quantum geometric Satake equivalence. When q is specialized to a $2m$-th root of unity, the reflection representation factors through the complex reflection group $G(m, m, n)$. I will report on joint work with Ben Elias and Ben Young about the corresponding exotic nilCoxeter algebra, which is generated by q-deformed divided difference operators; this new algebra has surprising features. A classic result of Demazure, for Weyl groups, states that the polynomial ring of the reflection representation is a Frobenius extension over its subring of invariant polynomials, and describes how the Frobenius trace can be constructed within the nilCoxeter algebra. We study the analogous Frobenius extension for $G(m, m, n)$, and identify the Frobenius trace within the exotic nilCoxeter algebra for $G(m, m, 3)$.