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The combinatorial representation theory of the Mantaci–Reutenauer algebras

The Mantaci–Reutenauer algebra is a finite-dimensional algebra arising as a subalgebra of the hyperoctahedral group algebra. It is a type B analogue of Solomon's descent algebra, a well-studied subalgebra of the symmetric group algebra with connections to algebraic combinatorics. Motivated by questions of Bonnafé, we study its representation theory, determining its (graded) Cartan matrix, Ext-quiver, and representation type. We use the combinatorics of signed necklaces and bipartitions to study these representation-theoretic invariants, and we recover the corresponding known results for Solomon's descent algebra as a special case. This is joint work with Alice Dell'Arciprete.