On the semisimplicity of the Brauer algebras of type C

Abstract

The Brauer algebra of type C, introduced by Cohen, Liu, and Yu, arises as the fixed-point subalgebra of a diagram automorphism of the classical Brauer algebra $B_{2r}(\delta)$. In this work, we establish a semisimplicity criterion for this algebra, proving that it is semisimple whenever the parameter δ is not an integer—extending Wenzl's result for the classical Brauer algebra. Additionally, we derive a branching rule describing the restriction of representations to natural subalgebras. These results contribute to the structural and representation-theoretic understanding of type C diagram algebras.