

On the Representation Theory of Brauer Algebras of Type C

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Abstract

In this talk, I will discuss two related problems in representation theory, involving hook fusion procedures for certain finite groups and the semisimplicity of the Brauer algebra of type C . The first concerns the explicit construction of primitive idempotents. I will describe hook fusion procedures for direct products of symmetric groups, hyperoctahedral groups, and the complex reflection groups $G(m, 1, n)$, where suitable evaluations of group-algebra-valued rational functions produce diagonal matrix elements and hence primitive idempotents. In the second part, I will consider the Brauer algebra of type C , a parameter-dependent diagram algebra obtained from reflection-symmetric Brauer diagrams. Using its cellular structure and the representation theory of hyperoctahedral groups, I will discuss how the semisimplicity problem can be reduced to the second cellular layer and present an exact criterion for semisimplicity over $\mathbb{C}$ for nonzero values of the parameter.