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Schur elements of degenerate cyclotomic Hecke algebras

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The non-degenerate cyclotomic Hecke algebras of type A (which are certain finite quotients of the non-degenerate affine Hecke algebras of type A) play an important role in the modular representation of finite groups of Lie type and most recently in the categorification of quantum groups. The degenerate cyclotomic Hecke algebras of type A is a parallel object similar to its non-degenerate counterparts which are certain finite quotient of the degenerate affine Hecke algebras of type A . The representation theory of the two classes of cyclotomic Hecke algebras are very similar. Dipper, James and Mathas [2] initiated the study of the modular representation of the non-degenerate cyclotomic Hecke algebras and proved these algebras are cellular in the sense of Graham and Lehrer [3]. The cellularity of the degenerate cyclotomic Hecke algebra of type A was proved by Ariki, Mathas and Rui [1] later. Though the degenerate cyclotomic Hecke algebra is not the specialization of the non-degenerate cyclotomic Hecke algebra at $q = 1$, its representation theory often looks like the “specialiation” of the representation of its non-degenerate counterpart at $q = 1$. In the paper under review, the author generalizes some results from the non-degenerate setting to the degenerate setting by using a similar argument used by Mathas (in the non-degenerate case) [4] and Ariki-Mathas-Rui’s cellular bases for the degenerate cyclotomic Hecke algebras

[1]. However, this generalization is not trivial at all and the main result is a nice supplement to the current knowledge of the degenerate cyclotomic Hecke algebra of type A .

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