

Nonsymmetric Macdonald polynomials, Kirillov-Reshetikhin crystals, and Demazure characters

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In recent work with Lenart, Naito, Sagaki and Shimozono we relate (nonsymmetric) Macdonald polynomials at $t=0$ (or equivalently q -Whittaker functions) to tensor products of Kirillov-Reshetikhin (KR) crystals graded by the energy function. In the case when the KR crystals are perfect, these tensor products yield Demazure crystals. On the level of characters, this confirms Ion's result that nonsymmetric Macdonald polynomials at $t=0$ are Demazure characters for the twisted cases. We have computer evidence that in the nonperfect cases the nonsymmetric Macdonald polynomials are sums of Demazure characters specified by certain ground state paths in the tensor product.

If time permits, we will also discuss an algorithm in type A on how to relate the expansion of Macdonald polynomials at $t=0$ in terms of KR crystals to k -Schur functions.