Mathematics > Combinatorics

Crystal energy functions via the charge in types A and C

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The Ram-Yip formula for Macdonald polynomials (at t=0) provides a statistic which we call charge. In types A and C it can be defined on tensor products of Kashiwara-Nakashima single column crystals. In this paper we prove that the charge is equal to the (negative of the) energy function on affine crystals. The algorithm for computing charge is much simpler and can be more efficiently computed than the recursive definition of energy in terms of the combinatorial R-matrix.

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