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Combinatorics of Kostka-Foulkes polynomials.

Lusztig defined the Kostka-Foulkes polynomial $K_{\lambda\mu}(t)$ as a t -analogue of the multiplicity of a weight μ in the irreducible representation of highest weight λ of a semisimple Lie algebra. This polynomial has remarkable properties, such as being an affine Kazhdan-Lusztig polynomial. Finding combinatorial formulas for $K_{\lambda\mu}(t)$ beyond type A_n has been a long-standing problem. We give the first such formula, for $K_{\lambda,0}(t)$ in type C_n ; the special case $\mu = 0$ is, in fact, the most complex one. We use combinatorics of Kashiwara's crystal graphs, as well as a recent non-stable branching rule for the symplectic group due to J.-H. Kwon. Related aspects and applications will also be discussed. (Received February 18, 2018)