

1038-05-148

**Louis J. Billera\*** ([billera@math.cornell.edu](mailto:billera@math.cornell.edu)), Department of Mathematics, Malott Hall,  
Cornell University, Ithaca, NY 14853-4201. *The complete **cd**-index of a Bruhat interval.*

In recent work with Francesco Brenti (*Quasisymmetric functions and Kazhdan-Lusztig polynomials*, arXiv:0710.3965), we have defined, for a Bruhat interval in an arbitrary Coxeter group, a nonhomogeneous extension of the usual **cd**-index, called the *complete **cd**-index*. This noncommutative, nonhomogeneous polynomial has many interesting algebraic and combinatorial properties. For example, it specializes to the  $\tilde{R}$ -polynomial of the interval, yet contains enough information about the interval to give a simple representation of its Kazhdan-Lusztig polynomial.

While the definition of the complete **cd**-index was given in terms of a certain quasisymmetric function associated to a Bruhat interval, it can be given more directly in terms of paths in the corresponding Bruhat graph of the interval. Here we have to consider descents in terms of an arbitrary reflection ordering on the group. We review this definition, describe some of the properties of the complete **cd**-index and discuss some open problems. (Received February 05, 2008)