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Ehrhart polynomials of zonotopes.

The *Ehrhart polynomial* of a lattice polytope P encodes fundamental arithmetic data of P , namely, the number of integer lattice points in positive integral dilates of P . Mirroring Herb Wilf's much-cherished and still-wide-open question *which polynomials are chromatic polynomials?*, we present some new classification results for Ehrhart polynomials of *zonotopes*, i.e., projections of (higher dimensional) cubes. This includes a combinatorial description in terms of refined descent statistics of permutations and a formula in matroidal terms which complements a well-known zonotopal identity of Stanley (1991). Finally, we give a complete description of the convex hull of the Ehrhart coefficients of zonotopes in a given dimension: it is a simplicial cone spanned by refined Eulerian polynomials. (Received March 16, 2017)