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Unimodality the hard way. Preliminary report.

Many families of integer polynomials have nonnegative and palindromic coefficients, e.g., h -polynomials of spheres. For such a polynomial, unimodality is equivalent to having a nonnegative g -vector.

A sufficient, but not necessary condition for unimodality is having a nonnegative γ -vector. However, there are γ -vectors with negative entries whose corresponding h -polynomials are unimodal. We will give a straightforward characterization of such γ -vectors, and describe a paradigm for proving unimodality results via thorough understanding of γ -vectors, even when these vectors have negative entries. (Received August 19, 2015)