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The local h-vector of the cluster subdivision of a simplex

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The cluster complex $\Delta (\Phi)$ is an abstract simplicial complex, introduced by Fomin and Zelevinsky for a finite root system Φ. The positive part of $\Delta (\Phi)$ naturally defines a simplicial subdivision of the simplex on the vertex set of simple roots of Φ. The local h-vector of this subdivision, in the sense of Stanley, is computed and the corresponding γ-vector is shown to be nonnegative. Combinatorial interpretations to the entries of the local h-vector and the corresponding γ-vector are provided for the classical root systems, in terms of noncrossing partitions of types A and B. An analogous result is given for the barycentric subdivision of a simplex.

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