Fu, Changjian; Geng, Shengfei; Liu, Pin

Let $A$ be a cluster algebra of finite type and let \{\(y_1, \ldots, y_n\) be a cluster. Then each $y_i$ can be written as a polynomial in the cluster variables $x_1, \ldots, x_n$ divided by a monomial in the cluster variables, where the fraction can be assumed without common factor. Such monomials are encoded by the integer tuple $(d_1, \ldots, d_n)$, called denominator vector, encoding the monomial $x_1^{d_1} \cdot \cdots \cdot x_n^{d_n}$. Fomin and Zelevinsky conjectured that different cluster monomials have different denominator vectors and the denominator vectors of $y_1, \ldots, y_n$ form a basis of $\mathbb{Q}^n$. One of the main results of the present paper shows that for cluster algebras of type $A$, $B$, or $C$, the denominator vectors as explained above are linearly independent. The proof uses a large part of the theory of cluster algebras and its categorifications and in particular $\tau$-tilting theory. The first three chapters of the paper also give a very nice introduction of what is known in this direction.

Reviewer: Alexander Zimmermann (Amiens)

MSC:

13F60 Cluster algebras
16E30 Homological functors on modules (Tor, Ext, etc.) in associative algebras
16E05 Syzygies, resolutions, complexes in associative algebras
16G10 Representations of associative Artinian rings
18G80 Derived categories, triangulated categories

Keywords:
cluster tube; $\tau$-rigid module; denominator vector; $g$-vector; $c$-vector

Full Text: DOI arXiv

References:
[13] Cao, P.; Li, F.: Study on cluster algebras via abstract pattern and two conjectures on $(d\text{-})$-vectors and $(g\text{-})$-vectors.


This reference list is based on information provided by the publisher or from digital mathematics libraries. Its items are heuristically matched to zbMATH identifiers and may contain data conversion errors. It attempts to reflect the references listed in the original paper as accurately as possible without claiming the completeness or perfect precision of the matching.