Representations of Leavitt Path Algebras of Polynomial Growth*

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Abstract

We may associate to a finite di(rected)graph Γ its Leavitt Path Algebra (LPA) $L_F(\Gamma)$ with coefficients in a field F [1]. Many geometric properties of Γ correspond to algebraic properties of $L_F(\Gamma)$. Some of these properties depend only on the module category of $L_F(\Gamma)$. For instance, the cycles in Γ are pairwise disjoint if and only if $L_F(\Gamma)$ has finite Gelfand-Kirillov dimension (equivalently, polynomial growth) [2]. The exact Gelfand-Kirillov dimension of $L_F(\Gamma)$ and related invariants (such as the number of sinks and cycles in Γ) can also be determined from the module category of $L_F(\Gamma)$, that is, they are Morita invariants. We classify $L_F(\Gamma)$ with Gelfand-Kirillov dimension < 4 completely up to Morita equivalence via our reduction algorithm [3].

Keywords

Leavitt path algebras, Morita equivalence, Gelfand-Kirillov dimension.

References

[1] G. Abrams, P. Ara, M. Siles Molina, *Leavitt path algebras*, Lecture Notes in Mathematics Vol. 2191, Springer Verlag, 2017.

[2] A. Alahmedi, H. Alsulami, S. Jain, E. Zelmanov, *Structure of Leavitt Path Algebras of Polynomial Growth*, Proceedings of the National Academy of Sciences USA 110 (2013) 15222-15224.

[3] A. Koç, M. Özaydın, *Classification of Leavitt Path Algebras with Gelfand-Kirillov Dimension* < 4 *up to Morita Equivalence*, arXiv:2208.06357v1 (2022).

* This research is supported by TÜBİTAK 1001 grant 122F414.