VIETNAM ACADEMY OF
SCIENCE AND TECHNOLOGY
INSTITUTE OF MATHEMATICS

SOCIALIST REPUBLIC OF IETNAM
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SUMMARY OF PHD DISSERTATION

Dissertation title: Morita equivalence of Leavitt path algebras and its applications
Speciality: Algebra and Number theory
Speciality code: 9 46 01 04
PhD student: Ngô Tấn Phúc
Supervisors: Assoc. Prof. Dr. Trần Giang Nam
Training Institute: Institute of Mathematics, Vietnam Academy of Science and Technology

The main results of the dissertation include:

Let E be a finite graph, K a field and E_{sf} the resulting source-free subgraph of a source elimination process to E. The main results of the dissertation include:

(1) Showing that $L_K(E)$ is Morita equivalent to the direct sum of $L_K(E_{sf})$ and n copies of K, where n is the number of vertices which are sinks in E but which are not in E_{sf}. Also, we prove that $L_K(E)$ is isomorphic to the direct sum of n matrix algebras over K and $L_K(F)$, where F is explicitly constructed from E_{sf}. Consequently, we get the structure of Leavitt path algebras of finite no-exit graphs established by Abrams, Pino, Molina (2008).

(2) Showing that the Leavitt path algebra of a Hopf graph is isomorphic to the direct sum of some copies of the Leavitt path algebra of a connected component of the Hopf graph. Consequently, we give some classes of Hopf graphs satisfying the Abrams-Tomforde's Conjecture.

(3) Giving the criterions on the incidence matrix of E and E_{sf} for $L_K(E)$ has IBN. Consequently, we get that Cohn path algebras have IBN, established by Abrams, Kanuni (2016) and get that Leavitt path algebra of a finite graph in which every vertex is in at most one cycle has IBN, established by Koc, Ozaydin (2020).

(4) Giving the graph-theoretic criterion on E for $L_K(E)$ has UGN. Consequently, we get that that UGN and IBN properties are equivalent on the classes of Leavitt path algebras of Hopf graphs and Cayley graphs.

Hanoi, feb, 20, 2025

Supervisors

PGS. TS. Trần Giang Nam

PhD Student

Ngô Tấn Phúc