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Two-sided chain conditions in Leavitt path algebras

Leavitt path algebras are a natural generalization of the Leavitt algebras, which are a class of algebras introduced by Leavitt in 1962. For a directed graph E, the Leavitt path algebra $L_K(E)$ of E with coefficients in K has received much recent attention both from algebraists and analysts over the last decade. So far, some of the algebraic properties of Leavitt path algebras have been investigated, including primitivity, simplicity and being Noetherian.

First, we explicitly describe the generators of two-sided ideals in Leavitt path algebras associated to arbitrary graphs. We show that any two-sided ideal I of a Leavitt path algebra associated to an arbitrary graph is generated by elements of the form $(v + \sum_{i=1}^{n} \lambda_i g^i)(v - \sum_{e \in S} ee^*)$, where g is a cycle based at vertex v, and S is a finite subset of $s^{-1}(v)$. Then, we use this result to describe the necessary and sufficient conditions on the arbitrary sized graph E, such that the Leavitt path algebra associated to E satisfies two-sided chain conditions. This is joint work with Dr. Gene Abrams, Dr. Jason P. Bell and Dr. Kulumani M. Rangaswamy.