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Simple Lie algebras arising from Leavitt path algebras

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For a field K and directed graph E , we analyze those elements of the Leavitt path algebra $L_K(E)$ which lie in the commutator subspace $[L_K(E), L_K(E)]$. This analysis allows us to give easily computable necessary and sufficient conditions to determine which Lie algebras of the form $[L_K(E), L_K(E)]$ are simple, when E is row-finite (i.e., has finite out-degree) and $L_K(E)$ is simple.

Comments: 18 pages. In the second version the exposition has been improved, and various typos and minor errors have been corrected

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