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LAMOS: a linear algorithm to identify the origin of multiple optimal flux distributions in metabolic networks

Ehsan Motamedian , Fereshteh Naeimpoor

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**Highlights**

- In this work, a four-phase new algorithm (LAMOS) is proposed to identify the origin of optimal solutions.
- A current non-basic variable with zero reduced cost is iteratively substituted with a basic variable satisfying the feasibility condition to find the optimal vertices enclosing the optimal solution region.
- These basic and non-basic variables are key reaction pairs that their successive activity or inactivity causes alternate optimal solutions.
- Key reactions were 1-3% of all reactions for the large scale models and identification of these reactions using only 1% of optimal solutions was possible.

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